FES 12-24 • DOI/EIS-0403

# Final Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States

Volume 4
Nevada Proposed Solar Energy Zones
Chapter 11

July 2012

Bureau of Land Management
U.S. Department of Energy

**Final Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States (FES 12-24; DOE/EIS-0403)**

**Responsible Agencies:** The U.S. Department of the Interior (DOI) Bureau of Land Management (BLM) and the U.S. Department of Energy (DOE) are co-lead agencies. Nineteen cooperating agencies participated in the preparation of this PEIS: U.S. Department of Defense; U.S. Bureau of Reclamation; U.S. Fish and Wildlife Service; U.S. National Park Service; U.S. Environmental Protection Agency, Region 9; U.S. Army Corps of Engineers, South Pacific Division; Arizona Game and Fish Department; California Energy Commission; California Public Utilities Commission; Nevada Department of Wildlife; N-4 Grazing Board, Nevada; Utah Public Lands Policy Coordination Office; Clark County, Nevada, including Clark County Department of Aviation; Doña Ana County, New Mexico; Esmeralda County, Nevada; Eureka County, Nevada; Lincoln County, Nevada; Nye County, Nevada; and Saguache County, Colorado.

**Locations**: Arizona, California, Colorado, Nevada, New Mexico, and Utah.

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**Abstract**: The BLM and DOE have jointly prepared this PEIS to evaluate actions that the agencies are considering taking to further facilitate utility-scale solar energy development in six southwestern states.[1] For the BLM, this includes the evaluation of a new Solar Energy Program applicable to solar development on BLM-administered lands. For DOE, it includes the evaluation of developing new guidance to further facilitate utility-scale solar energy development and maximize the mitigation of associated environmental impacts. This Solar PEIS evaluates the potential environmental, social, and economic effects of the agencies' proposed actions and alternatives in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality's regulations for implementing NEPA (Title 40, Parts 1500–1508 of the *Code of Federal Regulations* [40 CFR Parts 1500–1508]), and applicable BLM and DOE authorities.

For the BLM, the Final Solar PEIS analyzes a no action alternative, under which solar energy development would continue on BLM-administered lands in accordance with the terms and conditions of the BLM's existing solar energy policies, and two action alternatives that involve implementing a new BLM Solar Energy Program that would allow the permitting of future solar energy development projects on public lands to proceed in a more efficient, standardized, and environmentally responsible manner. The proposed program would establish right-of-way authorization policies and design features applicable to all utility-scale solar energy development. It would identify categories of lands to be excluded from utility-scale solar energy development and specific locations well suited for utility-scale production of solar energy where the BLM would prioritize development (i.e., solar energy zones or SEZs). The proposed action would also allow for responsible utility-scale solar development on lands outside of priority areas.

1 Utility-scale facilities are defined as projects that generate electricity that is delivered into the electricity transmission grid, generally with capacities greater than 20 megawatts (MW).

For DOE, the Final PEIS analyzes a no action alternative, under which DOE would continue to address environmental concerns for DOE-supported solar projects on a case-by-case basis, and an action alternative, under which DOE would adopt programmatic environmental guidance for use in DOE-supported solar projects.

The BLM and DOE initiated the Solar PEIS process in May 2008. On December 17, 2010, the BLM and DOE published the Draft Solar PEIS. Subsequently, on October 28, 2011, the lead agencies published the Supplement to the Draft Solar PEIS, in which adjustments were made to elements of BLM's proposed Solar Energy Program to better meet BLM's solar energy objectives, and in which DOE's proposed programmatic environmental guidance was presented.

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# NOTATION

The following is a list of acronyms and abbreviations, chemical names, and units of measure used in this document. Some acronyms used only in tables may be defined only in those tables.

## GENERAL ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AADT | annual average daily traffic |
| AASHTO | American Association of State Highway and Transportation Officials |
| AC | alternating current |
| ACC | air-cooled condenser |
| ACEC | Area of Critical Environmental Concern |
| ADEQ | Arizona Department of Environmental Quality |
| ACHP | Advisory Council on Historic Preservation |
| ADOT | Arizona Department of Transportation |
| ADWR | Arizona Department of Water Resources |
| AERMOD | AMS/EPA Regulatory Model |
| AFC | Application for Certification |
| AGL | above ground level |
| AIM | Assessment, Inventory and Monitoring |
| AIRFA | American Indian Religious Freedom Act |
| AMA | active management area |
| AML | animal management level |
| ANHP | Arizona National Heritage Program |
| APE | area of potential effect |
| APLIC | Avian Power Line Interaction Committee |
| APP | Avian Protection Plan |
| APS | Arizona Public Service |
| AQCR | Air Quality Control Region |
| AQRV | air quality–related value |
| ARB | Air Resources Board |
| ARRA | American Recovery and Reinvestment Act of 2009 |
| ARRTIS | Arizona Renewable Resource and Transmission Identification Subcommittee |
| ARS | Agricultural Research Service |
| ARZC | Arizona and California |
| ATSDR | Agency for Toxic Substances and Disease Registry |
| AUM | animal unit month |
| AVSE | Arlington Valley Solar Energy |
| AVWS | Audio Visual Warning System |
| AWBA | Arizona Water Banking Authority |
| AWEA | American Wind Energy Association |
| AWRM | Active Water Resource Management |
| AZDA | Arizona Department of Agriculture |
| AZGFD | Arizona Game and Fish Department |

| | |
|---|---|
| AZGS | Arizona Geological Survey |
| BA | biological assessment |
| BAP | base annual production |
| BEA | Bureau of Economic Analysis |
| BISON-M | Biota Information System of New Mexico |
| BLM | Bureau of Land Management |
| BLM-CA | Bureau of Land Management, California |
| BMP | best management practice |
| BNSF | Burlington Northern Santa Fe |
| BO | biological opinion |
| BOR | U.S. Bureau of Reclamation |
| BPA | Bonneville Power Administration |
| BRAC | Blue Ribbon Advisory Council on Climate Change |
| BSE | Beacon Solar Energy |
| BSEP | Beacon Solar Energy Project |
| BTS | Bureau of Transportation Statistics |
| CAA | Clean Air Act |
| CAAQS | California Air Quality Standards |
| CAISO | California Independent System Operator |
| Caltrans | California Department of Transportation |
| C-AMA | California-Arizona Maneuver Area |
| CAP | Central Arizona Project |
| CARB | California Air Resources Board |
| CAReGAP | California Regional Gap Analysis Project |
| CASQA | California Stormwater Quality Association |
| CASTNET | Clean Air Status and Trends NETwork |
| CAWA | Colorado Agricultural Water Alliance |
| CCC | Civilian Conservation Corps |
| CDC | Centers for Disease Control and Prevention |
| CDCA | California Desert Conservation Area |
| CDFG | California Department of Fish and Game |
| CDNCA | California Desert National Conservation Area |
| CDOT | Colorado Department of Transportation |
| CDOW | Colorado Division of Wildlife (now Colorado Parks and Wildlife) |
| CDPHE | Colorado Department of Public Health and Environment |
| CDWR | California Department of Water Resources |
| CEC | California Energy Commission |
| CEQ | Council on Environmental Quality |
| CES | constant elasticity of substitution |
| CESA | California Endangered Species Act |
| CESF | Carrizo Energy Solar Farm |
| CFR | *Code of Federal Regulations* |
| CGE | computable general equilibrium |
| CHAT | crucial habitat assessment tool |

| | |
|---|---|
| CIRA | Cooperative Institute for Research in the Atmosphere |
| CLFR | compact linear Fresnel reflector |
| CNDDB | California Natural Diversity Database |
| CNEL | community noise equivalent level |
| CNHP | Colorado National Heritage Program |
| Colorado DWR | Colorado Division of Water Resources |
| $CO_2e$ | carbon dioxide equivalent |
| CPC | Center for Plant Conservation |
| CPUC | California Public Utilities Commission |
| CPV | concentrating photovoltaic |
| CRBSCF | Colorado River Basin Salinity Control Forum |
| CREZ | competitive renewable energy zone |
| CRPC | Cultural Resources Preservation Council |
| CRSCP | Colorado River Salinity Control Program |
| CSA | Candidate Study Area |
| CSC | Coastal Services Center |
| CSFG | carbon-sequestration fossil generation |
| CSP | concentrating solar power |
| CSQA | California Stormwater Quality Association |
| CSRI | Cultural Systems Research, Incorporated |
| CTG | combustion turbine generator |
| CTPG | California Transmission Planning Group |
| CTSR | Cumbres & Toltec Scenic Railroad |
| CUP | Conditional Use Permit |
| CVP | Central Valley Project |
| CWA | Clean Water Act |
| CWCB | Colorado Water Conservation Board |
| CWHRS | California Wildlife Habitat Relationship System |

| | |
|---|---|
| DC | direct current |
| DEM | digital elevation model |
| DHS | U.S. Department of Homeland Security |
| DIMA | Database for Inventory, Monitoring and Assessment |
| DLT | dedicated-line transmission |
| DNA | Determination of NEPA Adequacy |
| DNI | direct normal insulation |
| DNL | day-night average sound level |
| DoD | U.S. Department of Defense |
| DOE | U.S. Department of Energy |
| DOI | U.S. Department of the Interior |
| DOL | U.S. Department of Labor |
| DOT | U.S. Department of Transportation |
| DRECP | California Desert Renewable Energy Conservation Plan |
| DSM | demand-side management |
| DSRP | Decommissioning and Site Reclamation Plan |
| DTC/C-AMA | Desert Training Center/California–Arizona Maneuver Area |

| | |
|---|---|
| DWMA | Desert Wildlife Management Area |
| DWR | Division of Water Resources |
| EA | environmental assessment |
| EBID | Elephant Butte Irrigation District |
| ECAR | East Central Area Reliability Coordination Agreement |
| ECOS | Environmental Conservation Online System (USFWS) |
| EERE | Energy Efficiency and Renewable Energy (DOE) |
| Eg | band gap energy |
| EIA | Energy Information Administration (DOE) |
| EIS | environmental impact statement |
| EISA | Energy Independence and Security Act of 2007 |
| EMF | electromagnetic field |
| E.O. | Executive Order |
| EPA | U.S. Environmental Protection Agency |
| EPRI | Electric Power Research Institute |
| EQIP | Environmental Quality Incentives Program |
| ERCOT | Electric Reliability Council of Texas |
| ERO | Electric Reliability Organization |
| ERS | Economic Research Service |
| ESA | Endangered Species Act of 1973 |
| ESRI | Environmental Systems Research Institute |
| FAA | Federal Aviation Administration |
| FBI | Federal Bureau of Investigation |
| FEMA | Federal Emergency Management Agency |
| FERC | Federal Energy Regulatory Commission |
| FHWA | Federal Highway Administration |
| FIRM | Flood Insurance Rate Map |
| FLPMA | Federal Land Policy and Management Act of 1976 |
| FONSI | Finding of No Significant Impact |
| FR | *Federal Register* |
| FRCC | Florida Reliability Coordinating Council |
| FSA | Final Staff Assessment |
| FTE | full-time equivalent |
| FY | fiscal year |
| G&TM | generation and transmission modeling |
| GCRP | U.S. Global Climate Research Program |
| GDA | generation development area |
| GHG | greenhouse gas |
| GIS | geographic information system |
| GMU | game management unit |
| GPS | global positioning system |
| GTM | Generation and Transmission Model |

| | |
|---|---|
| GUAC | Groundwater Users Advisory Council |
| GWP | global warming potential |
| HA | herd area |
| HAP | hazardous air pollutant |
| HAZCOM | hazard communication |
| HCE | heat collection element |
| HCP | Habitat Conservation Plan |
| HMA | herd management area |
| HMMH | Harris Miller Miller & Hanson, Inc. |
| HRSG | heat recovery steam generator |
| HSPD | Homeland Security Presidential Directive |
| HTF | heat transfer fluid |
| HUC | hydrologic unit code |
| HVAC | heating, ventilation, and air-conditioning |
| I | Interstate |
| IARC | International Agency for Research on Cancer |
| IBA | important bird area |
| ICE | internal combustion engine |
| ICPDS | Imperial County Planning & Development Services |
| ICWMA | Imperial County Weed Management Area |
| IDT | interdisplinary team |
| IEC | International Electrochemical Commission |
| IFR | instrument flight rule |
| IID | Imperial Irrigation District |
| IM | Instruction Memorandum |
| IMPS | Iron Mountain Pumping Station |
| IMS | interim mitigation strategy |
| INA | Irrigation Non-Expansion Area |
| IOP | Interagency Operating Procedure |
| IOU | investor-owned utility |
| IPCC | Intergovernmental Panel on Climate Change |
| ISA | Independent Science Advisor; Instant Study Area |
| ISB | Intermontane Seismic Belt |
| ISCC | integrated solar combined cycle |
| ISDRA | Imperial Sand Dunes Recreation Area |
| ISEGS | Ivanpah Solar Energy Generating System |
| ISO | independent system operator; iterative self-organizing |
| ITFR | Interim Temporary Final Rulemaking |
| ITP | incidental take permit |
| IUCNNR | International Union for Conservation of Nature and Natural Resources |
| IUCNP | International Union for Conservation of Nature Pakistan |
| KGA | known geothermal resources area |
| KML | keyhole markup language |

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|---|---|
| KOP | key observation point |
| KSLA | known sodium leasing area |
| LCC | Landscape Conservation Cooperative |
| LCCRDA | Lincoln County Conservation, Recreation, and Development Act of 2004 |
| LCOE | levelized cost of energy |
| $L_{dn}$ | day-night average sound level |
| LDWMA | Low Desert Weed Management Area |
| $L_{eq}$ | equivalent sound pressure level |
| LiDAR | light detection and ranging |
| LLA | limited land available |
| LLRW | low-level radioactive waste (waste classification) |
| LPN | listing priority number |
| LRG | Lower Rio Grande |
| LSA | lake and streambed alteration |
| LSE | load-serving entity |
| LTMP | long-term monitoring and adaptive management plan |
| LTVA | long-term visitor area |
| MAAC | Mid-Atlantic Area Council |
| MAIN | Mid-Atlantic Interconnected Network |
| MAPP | methyl acetylene propadiene stabilizer; Mid-Continent Area Power Pool |
| MCAS | Marine Corps Air Station |
| MCL | maximum contaminant level |
| MEB | Marine Expeditionary Brigade |
| MFP | Management Framework Plan |
| MIG | Minnesota IMPLAN Group |
| MLA | maximum land available |
| MOA | military operating area |
| MOU | Memorandum of Understanding |
| MPDS | maximum potential development scenario |
| MRA | Multiple Resource Area |
| MRI | Midwest Research Institute |
| MRO | Midwest Reliability Organization |
| MSDS | Material Safety Data Sheet |
| MSL | mean sea level |
| MTR | military training route |
| MVEDA | Mesilla Valley Economic Development Alliance |
| MWA | Mojave Water Agency |
| MWD | Metropolitan Water District |
| MWMA | Mojave Weed Management Area |
| NAAQS | National Ambient Air Quality Standard(s) |
| NADP | National Atmospheric Deposition Program |
| NAGPRA | Native American Graves Protection and Repatriation Act |
| NAHC | Native American Heritage Commission (California) |
| NAIC | North American Industrial Classification System |

| | |
|---|---|
| NASA | National Aeronautics and Space Administration |
| NCA | National Conservation Area |
| NCCAC | Nevada Climate Change Advisory Committee |
| NCDC | National Climatic Data Center |
| NCES | National Center for Education Statistics |
| NDAA | National Defense Authorization Act |
| NDCNR | Nevada Department of Conservation and Natural Resources |
| NDEP | Nevada Division of Environmental Protection |
| NDOT | Nevada Department of Transportation |
| NDOW | Nevada Department of Wildlife |
| NDWP | Nevada Division of Water Planning |
| NDWR | Nevada Division of Water Resources |
| NEAP | Natural Events Action Plan |
| NEC | National Electric Code |
| NED | National Elevation Database |
| NEP | Natural Events Policy |
| NEPA | National Environmental Policy Act of 1969 |
| NERC | North American Electricity Reliability Corporation |
| NGO | non-governmental organization |
| NHA | National Heritage Area |
| NHD | National Hydrography Dataset |
| NHNM | National Heritage New Mexico |
| NHPA | National Historic Preservation Act of 1966 |
| NID | National Inventory of Dams |
| NLCS | National Landscape Conservation System |
| NMAC | *New Mexico Administrative Code* |
| NMBGMR | New Mexico Bureau of Geology and Mineral Resources |
| NMDGF | New Mexico Department of Game and Fish |
| NM DOT | New Mexico Department of Transportation |
| NMED | New Mexico Environment Department |
| NMED-AQB | New Mexico Environment Department-Air Quality Board |
| NMFS | National Marine Fisheries Service |
| NMOSE | New Mexico Office of the State Engineer |
| NMSU | New Mexico State University |
| NNHP | Nevada Natural Heritage Program |
| NNL | National Natural Landmark |
| NNSA | National Nuclear Security Administration |
| NOA | Notice of Availability |
| NOAA | National Oceanic and Atmospheric Administration |
| NOI | Notice of Intent |
| NP | National Park |
| NPDES | National Pollutant Discharge Elimination System |
| NPL | National Priorities List |
| NPS | National Park Service |
| NPV | net present value |
| NRA | National Recreation Area |

| | |
|---|---|
| NRCS | Natural Resources Conservation Service |
| NREL | National Renewable Energy Laboratory |
| NRHP | *National Register of Historic Places* |
| NRS | *Nevada Revised Statutes* |
| NSC | National Safety Council |
| NSO | no surface occupancy |
| NSTC | National Science and Technology Council |
| NTHP | National Trust for Historic Preservation |
| NTS | Nevada Test Site |
| NTTR | Nevada Test and Training Range |
| NVCRS | Nevada Cultural Resources Inventory System |
| NV DOT | Nevada Department of Transportation |
| NWCC | National Wind Coordinating Committee |
| NWI | National Wetlands Inventory |
| NWIS | National Water Information System (USGS) |
| NWPP | Northwest Power Pool |
| NWR | National Wildlife Refuge |
| NWSRS | National Wild and Scenic River System |
| | |
| O&M | operation and maintenance |
| ODFW | Oregon Department of Fish and Wildlife |
| OHV | off-highway vehicle |
| ONA | Outstanding Natural Area |
| ORC | organic Rankine cycle |
| OSE/ISC | Office of the State Engineer/Interstate Stream Commission |
| OSHA | Occupational Safety and Health Administration |
| OTA | Office of Technology Assessment |
| | |
| PA | Programmatic Agreement |
| PAD | Preliminary Application Document |
| PAH | polycyclic aromatic hydrocarbon |
| PAT | peer analysis tool |
| PCB | polychlorinated biphenyl |
| PCM | purchase change material |
| PCS | power conditioning system |
| PCU | power converting unit |
| PEIS | programmatic environmental impact statement |
| PFYC | potential fossil yield classification |
| PGH | Preliminary General Habitat |
| PIER | Public Interest Energy Research |
| P.L. | Public Law |
| PLSS | Public Land Survey System |
| PM | particulate matter |
| $PM_{2.5}$ | particulate matter with a diameter of 2.5 μm or less |
| $PM_{10}$ | particulate matter with a diameter of 10 μm or less |
| PPA | Power Purchase Agreement |

| | |
|---|---|
| P-P-D | population-to-power density |
| PPH | Preliminary Priority Habitat |
| POD | plan of development |
| POU | publicly owned utility |
| PPA | Power Purchase Agreement |
| PPE | personal protective equipment |
| PSD | Prevention of Significant Deterioration |
| PURPA | Public Utility Regulatory Policy Act |
| PV | photovoltaic |
| PVID | Palo Verde Irrigation District |
| PWR | public water reserve |
| | |
| QRA | qualified resource area |
| | |
| R&I | relevance and importance |
| RAC | Resource Advisory Council |
| RCE | Reclamation Cost Estimate |
| RCI | residential, commercial, and industrial (sector) |
| RCRA | Resource Conservation and Recovery Act of 1976 |
| RD&D | research, development, and demonstration; research, development, and deployment |
| RDBMS | Relational Database Management System |
| RDEP | Restoration Design Energy Project |
| REA | Rapid Ecoregional Assessment |
| REAT | Renewable Energy Action Team |
| REDA | Renewable Energy Development Area |
| REDI | Renewable Energy Development Infrastructure |
| REEA | Renewable Energy Evaluation Area |
| ReEDS | Regional Energy Deployment System |
| REPG | Renewable Energy Policy Group |
| RETA | Renewable Energy Transmission Authority |
| RETAAC | Renewable Energy Transmission Access Advisory Committee |
| RETI | Renewable Energy Transmission Initiative |
| REZ | renewable energy zone |
| RF | radio frequency |
| RFC | Reliability First Corporation |
| RFDS | reasonably foreseeable development scenario |
| RGP | Rio Grande Project |
| RGWCD | Rio Grande Water Conservation District |
| RMP | Resource Management Plan |
| RMPA | Rocky Mountain Power Area |
| RMZ | Resource Management Zone |
| ROD | Record of Decision |
| ROI | region of influence |
| ROS | recreation opportunity spectrum |
| ROW | right-of-way |

| | |
|---|---|
| RPG | renewable portfolio goal |
| RPS | Renewable Portfolio Standard |
| RRC | Regional Reliability Council |
| RSEP | Rice Solar Energy Project |
| RSI | Renewable Systems Interconnection |
| RTO | regional transmission organization |
| RTTF | Renewable Transmission Task Force |
| RV | recreational vehicle |
| | |
| SAAQS | State Ambient Air Quality Standard(s) |
| SAMHSA | Substance Abuse and Mental Health Services Administration |
| SCADA | supervisory control and data acquisition |
| SCE | Southern California Edison |
| SCRMA | Special Cultural Resource Management Area |
| SDRREG | San Diego Regional Renewable Energy Group |
| SDWA | Safe Drinking Water Act of 1974 |
| SEGIS | Solar Energy Grid Integration System |
| SEGS | Solar Energy Generating System |
| SEI | Sustainable Energy Ireland |
| SEIA | Solar Energy Industrial Association |
| SES | Stirling Energy Systems |
| SETP | Solar Energy Technologies Program (DOE) |
| SEZ | solar energy zone |
| SHPO | State Historic Preservation Office(r) |
| SIP | State Implementation Plan |
| SLRG | San Luis & Rio Grande |
| SMA | Special Management Area |
| SMART | specific, measurable, achievable, relevant, and time sensitive |
| SMP | suggested management practice |
| SNWA | Southern Nevada Water Authority |
| SPP | Southwest Power Pool |
| SRMA | Special Recreation Management Area |
| SSA | Socorro Seismic Anomaly |
| SSI | self-supplied industry |
| ST | solar thermal |
| STG | steam turbine generator |
| SUA | special use airspace |
| SWAT | Southwest Area Transmission |
| SWIP | Southwest Intertie Project |
| SWPPP | Stormwater Pollution Prevention Plan |
| SWReGAP | Southwest Regional Gap Analysis Project |
| | |
| TAP | toxic air pollutant |
| TCC | Transmission Corridor Committee |
| TDS | total dissolved solids |
| TEPPC | Transmission Expansion Planning Policy Committee |

| | |
|---|---|
| TES | thermal energy storage |
| TRACE | Transmission Routing and Configuration Estimator |
| TSA | Transportation Security Administration |
| TSCA | Toxic Substances Control Act of 1976 |
| TSDF | treatment, storage, and disposal facility |
| TSP | total suspended particulates |
| | |
| UACD | Utah Association of Conservation Districts |
| UBWR | Utah Board of Water Resources |
| UDA | Utah Department of Agriculture |
| UDEQ | Utah Department of Environmental Quality |
| UDNR | Utah Department of Natural Resources |
| UDOT | Utah Department of Transportation |
| UDWQ | Utah Division of Water Quality |
| UDWR | Utah Division of Wildlife Resources |
| UGS | Utah Geological Survey |
| UNEP | United Nations Environmental Programme |
| UNPS | Utah Native Plant Society |
| UP | Union Pacific |
| UREZ | Utah Renewable Energy Zone |
| USACE | U.S. Army Corps of Engineers |
| USAF | U.S. Air Force |
| USC | *United States Code* |
| USDA | U.S. Department of Agriculture |
| USFS | U.S. Forest Service |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | U.S. Geological Survey |
| Utah DWR | Utah Division of Water Rights |
| UTTR | Utah Test and Training Range |
| UWS | Underground Water Storage, Savings and Replenishment Act |
| | |
| VACAR | Virginia–Carolinas Subregion |
| VCRS | Visual Contrast Rating System |
| VFR | visual flight rule |
| VOC | volatile organic compound |
| VRHCRP | Virgin River Habitat Conservation & Recovery Program |
| VRI | Visual Resource Inventory |
| VRM | Visual Resource Management |
| | |
| WA | Wilderness Area |
| WECC | Western Electricity Coordinating Council |
| WECC CAN | Western Electricity Coordinating Council–Canada |
| WEG | wind erodibility group |
| Western | Western Area Power Administration |
| WGA | Western Governors' Association |
| WGFD | Wyoming Game and Fish Department |

| | |
|---|---|
| WHA | wildlife habitat area |
| WHO | World Health Organization |
| WIA | Wyoming Infrastructure Authority |
| WRAP | Water Resources Allocation Program; Western Regional Air Partnership |
| WRCC | Western Regional Climate Center |
| WREZ | Western Renewable Energy Zones |
| WRRI | Water Resources Research Institute |
| WSA | Wilderness Study Area |
| WSC | wildlife species of special concern |
| WSMR | White Sands Missile Range |
| WSR | Wild and Scenic River |
| WSRA | Wild and Scenic Rivers Act of 1968 |
| WWII | World War II |
| WWP | Western Watersheds Project |
| | |
| YPG | Yuma Proving Ground |
| | |
| ZITA | zone identification and technical analysis |
| ZLD | zero liquid discharge |

## CHEMICALS

| | |
|---|---|
| $CH_4$ | methane |
| CO | carbon monoxide |
| $CO_2$ | carbon dioxide |
| | |
| $H_2S$ | hydrogen sulfide |
| Hg | mercury |
| | |
| $N_2O$ | nitrous oxide |
| $NH_3$ | ammonia |
| $NO_2$ | nitrogen dioxide |
| $NO_x$ | nitrogen oxides |
| | |
| $O_3$ | ozone |
| | |
| Pb | lead |
| | |
| $SF_6$ | sulfur hexafluoride |
| $SO_2$ | sulfur dioxide |
| $SO_x$ | sulfur oxides |

## UNITS OF MEASURE

| | |
|---|---|
| ac-ft | acre-foot (feet) |
| bhp | brake horsepower |
| | |
| °C | degree(s) Celsius |
| cf | cubic foot (feet) |
| cfs | cubic foot (feet) per second |
| cm | centimeter(s) |
| | |
| dB | decibel(s) |
| dBA | A-weighted decibel(s) |
| | |
| °F | degree(s) Fahrenheit |
| ft | foot (feet) |
| $ft^2$ | square foot (feet) |
| $ft^3$ | cubic foot (feet) |
| | |
| g | gram(s) |
| gal | gallon(s) |

| | |
|---|---|
| GJ | gigajoule(s) |
| gpcd | gallon per capita per day |
| gpd | gallon(s) per day |
| gpm | gallon(s) per minute |
| GW | gigawatt(s) |
| GWh | gigawatt hour(s) |
| GWh/yr | gigawatt hour(s) per year |
| h | hour(s) |
| ha | hectare(s) |
| Hz | hertz |
| in. | inch(es) |
| J | joule(s) |
| K | degree(s) Kelvin |
| kcal | kilocalorie(s) |
| kg | kilogram(s) |
| kHz | kilohertz |
| km | kilometer(s) |
| $km^2$ | square kilometer(s) |
| kPa | kilopascal(s) |
| kV | kilovolt(s) |
| kVA | kilovolt-ampere(s) |
| kW | kilowatt(s) |
| kWh | kilowatt-hour(s) |
| kWp | kilowatt peak |
| L | liter(s) |
| lb | pound(s) |
| m | meter(s) |
| $m^2$ | square meter(s) |
| $m^3$ | cubic meter(s) |
| mg | milligram(s) |
| Mgal | million gallons |
| mi | mile(s) |
| $mi^2$ | square mile(s) |
| min | minute(s) |
| mm | millimeter(s) |
| MMt | million metric ton(s) |
| MPa | megapascal(s) |
| mph | mile(s) per hour |
| MVA | megavolt-ampere(s) |
| MW | megawatt(s) |
| MWe | megawatt(s) electric |
| MWh | megawatt-hour(s) |
| ppm | part(s) per million |
| psi | pound(s) per square inch |
| psia | pound(s) per square inch absolute |
| rpm | rotation(s) per minute |
| s | second(s) |
| scf | standard cubic foot (feet) |
| TWh | terawatt hour(s) |
| VdB | vibration velocity decibel(s) |
| W | watt(s) |
| $yd^2$ | square yard(s) |
| $yd^3$ | cubic yard(s) |
| yr | year(s) |
| µg | microgram(s) |
| µm | micrometer(s) |

## ENGLISH/METRIC AND METRIC/ENGLISH EQUIVALENTS

The following table lists the appropriate equivalents for English and metric units.

| Multiply | By | To Obtain |
|---|---|---|
| ***English/Metric Equivalents*** | | |
| acres | 0.004047 | square kilometers ($km^2$) |
| acre-feet (ac-ft) | 1,234 | cubic meters ($m^3$) |
| cubic feet ($ft^3$) | 0.02832 | cubic meters ($m^3$) |
| cubic yards ($yd^3$) | 0.7646 | cubic meters ($m^3$) |
| degrees Fahrenheit (ºF) –32 | 0.5555 | degrees Celsius (ºC) |
| feet (ft) | 0.3048 | meters (m) |
| gallons (gal) | 3.785 | liters (L) |
| gallons (gal) | 0.003785 | cubic meters ($m^3$) |
| inches (in.) | 2.540 | centimeters (cm) |
| miles (mi) | 1.609 | kilometers (km) |
| miles per hour (mph) | 1.609 | kilometers per hour (kph) |
| pounds (lb) | 0.4536 | kilograms (kg) |
| short tons (tons) | 907.2 | kilograms (kg) |
| short tons (tons) | 0.9072 | metric tons (t) |
| square feet ($ft^2$) | 0.09290 | square meters ($m^2$) |
| square yards ($yd^2$) | 0.8361 | square meters ($m^2$) |
| square miles ($mi^2$) | 2.590 | square kilometers ($km^2$) |
| yards (yd) | 0.9144 | meters (m) |
| ***Metric/English Equivalents*** | | |
| centimeters (cm) | 0.3937 | inches (in.) |
| cubic meters ($m^3$) | 0.00081 | acre-feet (ac-ft) |
| cubic meters ($m^3$) | 35.31 | cubic feet ($ft^3$) |
| cubic meters ($m^3$) | 1.308 | cubic yards ($yd^3$) |
| cubic meters ($m^3$) | 264.2 | gallons (gal) |
| degrees Celsius (ºC) +17.78 | 1.8 | degrees Fahrenheit (ºF) |
| hectares (ha) | 2.471 | acres |
| kilograms (kg) | 2.205 | pounds (lb) |
| kilograms (kg) | 0.001102 | short tons (tons) |
| kilometers (km) | 0.6214 | miles (mi) |
| kilometers per hour (kph) | 0.6214 | miles per hour (mph) |
| liters (L) | 0.2642 | gallons (gal) |
| meters (m) | 3.281 | feet (ft) |
| meters (m) | 1.094 | yards (yd) |
| metric tons (t) | 1.102 | short tons (tons) |
| square kilometers ($km^2$) | 247.1 | acres |
| square kilometers ($km^2$) | 0.3861 | square miles ($mi^2$) |
| square meters ($m^2$) | 10.76 | square feet ($ft^2$) |
| square meters ($m^2$) | 1.196 | square yards ($yd^2$) |

# 11 UPDATE TO AFFECTED ENVIRONMENT AND IMPACT ASSESSMENT FOR PROPOSED SOLAR ENERGY ZONES IN NEVADA

The U.S. Department of the Interior Bureau of Land Management (BLM) has carried 17 solar energy zones (SEZs) forward for analysis in this Final Solar Programmatic Environmental Impact Statement (PEIS). These SEZs total approximately 285,000 acres (1,153 km$^2$) of land potentially available for development. This chapter includes analyses of potential environmental impacts for the proposed SEZs in Nevada—Amargosa, Dry Lake, Dry Lake Valley North, Gold Point, and Millers—as well as summaries of the previously proposed Delamar Valley and East Mormon Mountain SEZs and why they were eliminated from further consideration. The SEZ-specific analyses provide documentation from which the BLM will tier future project authorizations, thereby limiting the required scope and effort of project-specific National Environmental Policy Act of 1969 (NEPA) analyses.

The BLM is committed to collecting additional SEZ-specific resource data and conducting additional analysis in order to more efficiently facilitate future development in SEZs. The BLM developed action plans for each of the 17 SEZs carried forward as part of the Supplement to the Draft Solar PEIS (BLM and DOE 2011). These action plans described additional data that could be collected for individual SEZs and proposed data sources and methods for the collection of those data. Work is underway to collect additional data as specified under these action plans (e.g., additional data collection to support evaluation of cultural, visual, and water resources has begun). As the data become available, they will be posted on the project Web site (http://solareis.anl.gov) for use by applicants and the BLM and other agency staff.

To accommodate the flexibility described in the BLM's program objectives and in light of anticipated changes in technologies and environmental conditions over time, the BLM has removed some of the prescriptive SEZ-specific design features presented in the Draft Solar PEIS (BLM and DOE 2010) and the Supplement to the Draft (e.g., height restrictions on technologies used to address visual resource impacts). Alternatively, the BLM will give full consideration to any outstanding conflicts in SEZs as part of the competitive process being developed through rulemaking (see Section 2.2.2.2.1).

In preparing selected parcels for competitive offer, the BLM will review all existing analysis for an SEZ and consider any new or changed circumstances that may affect the development of the SEZ. The BLM will also work with appropriate federal, state, and local agencies, and affected tribes, as necessary, to discuss SEZ-related issues. This work would ultimately inform how a parcel would be offered competitively (e.g., parcel size and configuration, technology limitations, mitigation requirements, and parcel-specific competitive process). Prior to issuing a notice of competitive offer, the BLM would complete appropriate NEPA analysis to support the offer. This analysis would tier to the analysis for SEZs in the Solar PEIS to the extent practicable.

It is the BLM's goal to compile all data, information, and analyses for SEZs from the Draft Solar PEIS, the Supplement to the Draft, and this Final Solar PEIS into a single location accessible via the project Web site (http://solareis.anl.gov) for ease of use by applicants and the BLM and other agency staff.

This chapter is an update to the information on Nevada SEZs presented in the Draft Solar PEIS. As stated previously, the Delamar Valley and East Mormon SEZs were dropped from further consideration through the Supplement to the Draft Solar PEIS. For the remaining five Nevada SEZs—Amargosa, Dry Lake, Dry Lake Valley North, Gold Point, and Millers—the information presented in this chapter supplements and updates, but does not replace, the information provided in the corresponding Chapter 11 on proposed SEZs in Nevada in the Draft Solar PEIS. Corrections to incorrect information in Sections 11.1, 11.3, 11.4, 11.6, and 11.7 of the Draft Solar PEIS and in Sections C.4.1, C.4.2, C.4.3, C.4.4, and C.4.5 of the Supplement to the Draft are provided in Sections 11.1.26, 11.3.26, 11.4.26, 11.6.26, and 11.7.26 of this Final Solar PEIS.

# 11.1 AMARGOSA VALLEY

## 11.1.1 Background and Summary of Impacts

### 11.1.1.1 General Information

The proposed Amargosa Valley SEZ is located in Nye County in southern Nevada near the California border. In 2008, the county population was 44,175, while adjacent Clark County to the southeast had a population of 1,879,093. The closest towns to the SEZ are Beatty, about 11 mi (18 km) north on U.S. 95, and Amargosa Valley, about 12 mi (20 km) southeast on U.S. 95. Las Vegas is about 84 mi (135 km) southeast. The nearest major road access to the proposed Amargosa Valley SEZ is via U.S. 95, which is adjacent to the northeast boundary of the SEZ. Access to the interior of the SEZ is by dirt roads. The nearest railroad access is approximately 100 mi (161 km) away, and one small airport near Beatty serves the area. The Nevada Test Site (NTS) lies about 10 mi (16 km) east, and the Nellis Air Force Range lies a similar distance northeast of the proposed SEZ. As of October 28, 2011, there was one pending solar application adjacent to the southeast boundary of the SEZ.

As published in the Draft Solar PEIS, the proposed Amargosa Valley SEZ had a total area of 31,625 acres (128.0 km$^2$). In the Supplement to the Draft Solar PEIS, the size of the proposed Amargosa Valley SEZ was reduced to eliminate the area south and west of the Amargosa River and the area northeast of U.S. 95, a total of 21,888 acres (88.6 km$^2$) (see Figure 11.1.1.1-1). Eliminating these areas is primarily intended to avoid or minimize many potential impacts, including impacts on Death Valley National Park (NP) and the desert tortoise. In addition, 1,258 acres (5.1 km$^2$) of Amargosa River floodplain north of the river but within the SEZ boundaries has been identified as a non-development area (see Figure 11.1.1.1-2); the remaining developable area within the SEZ is 8,479 acres (34.3 km$^2$).

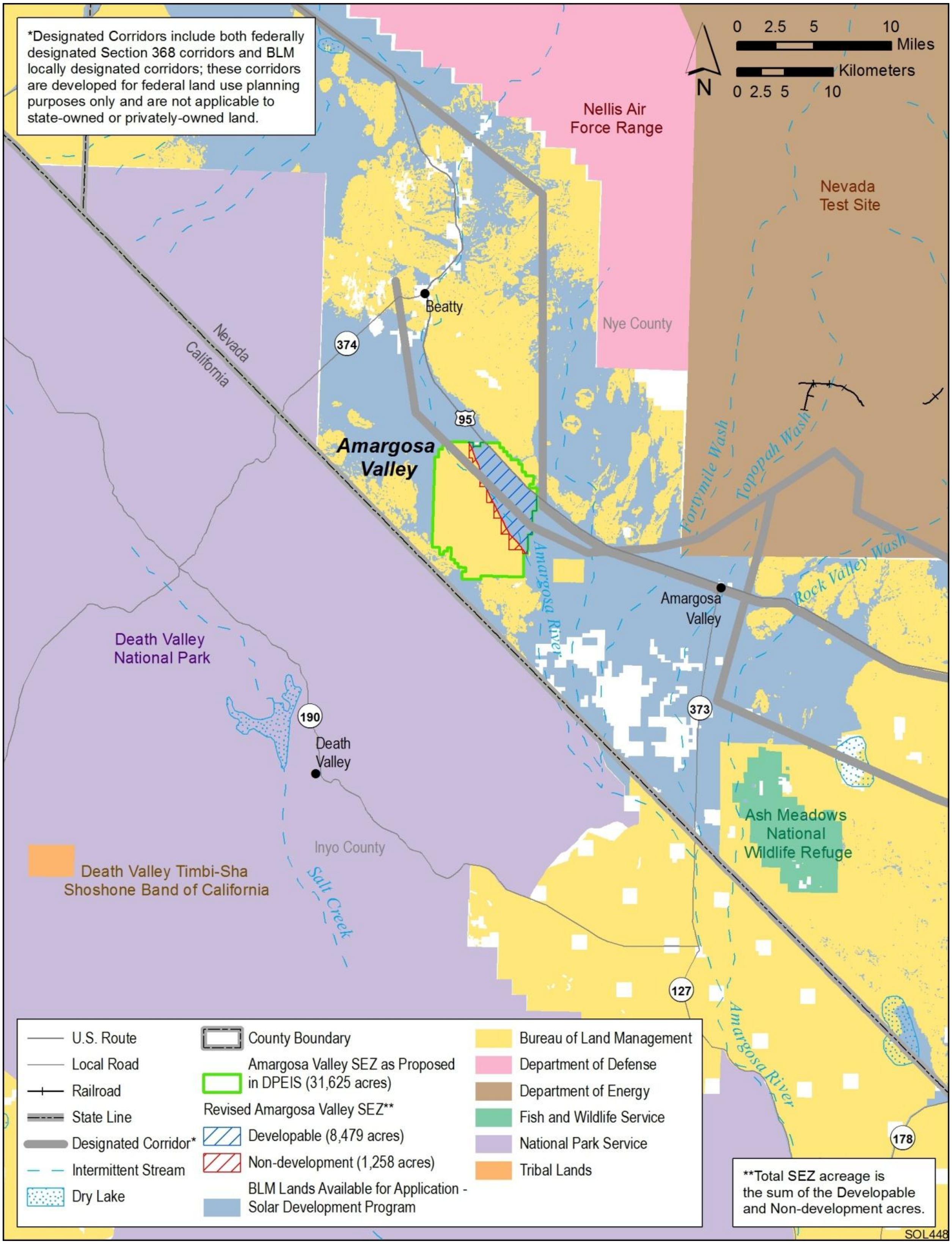


**FIGURE 11.1.1.1-1 Proposed Amargosa Valley SEZ as Revised**

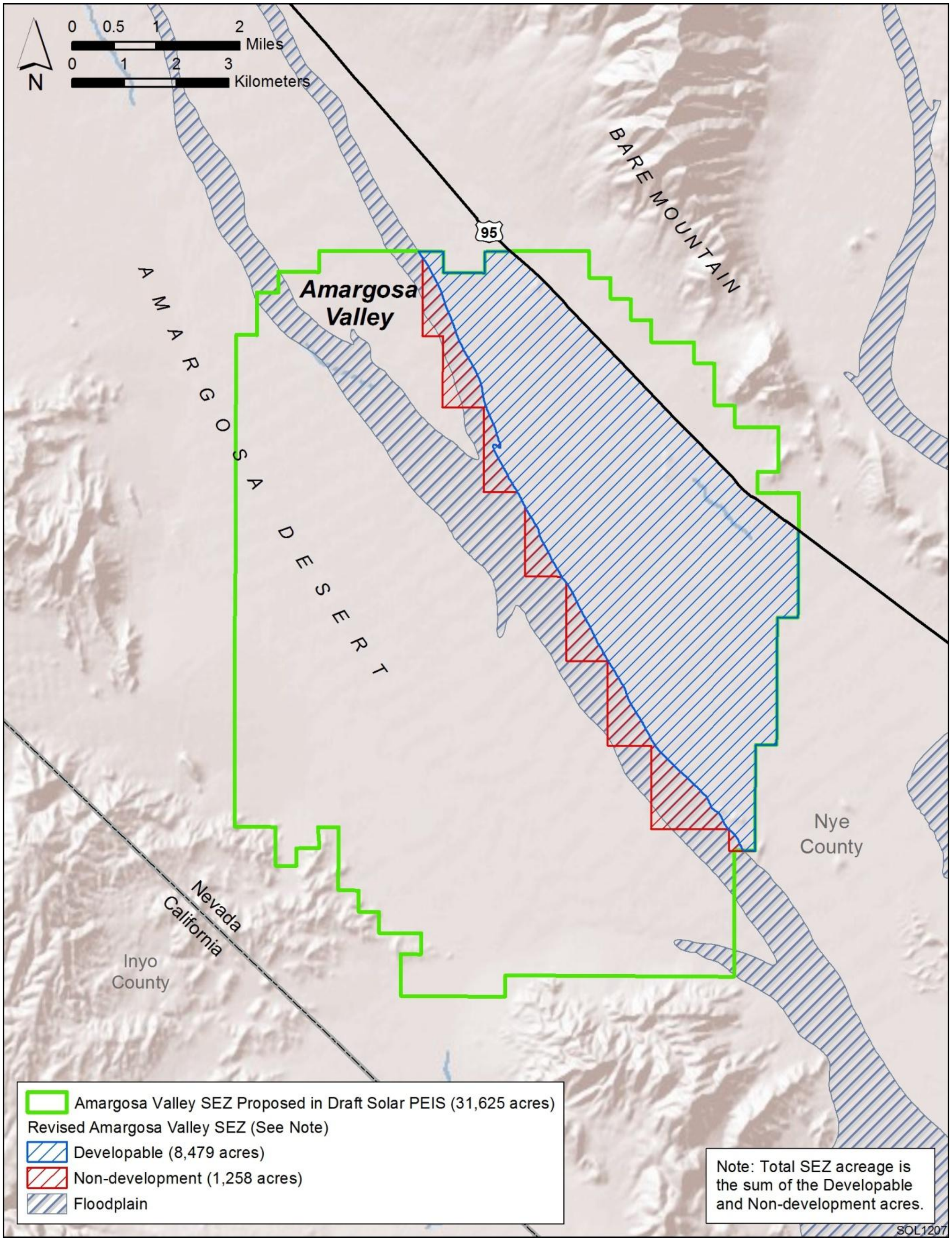


**FIGURE 11.1.1.1-2 Developable and Non-development Areas for the Proposed Amargosa Valley SEZ as Revised**

Because of the extensive potential impacts from solar development in the portion of the Amargosa Valley SEZ that has been eliminated, those lands are proposed as solar right-of-way (ROW) exclusion areas; that is, applications for solar development on those lands will not be accepted by the U.S. Department of the Interior Bureau of Land Management (BLM).

The analyses in the following sections update the affected environment and potential environmental, cultural, and socioeconomic impacts associated with utility-scale solar energy development in the Amargosa Valley SEZ as described in the Draft Solar PEIS.

### 11.1.1.2 Development Assumptions for the Impact Analysis

Maximum solar development of the proposed Amargosa Valley SEZ is assumed to be 80% of the developable SEZ area over a period of 20 years, a maximum of 6,783 acres (27.4 km$^2$) (Table 11.1.1.2-1). Full development of the Amargosa Valley SEZ would allow development of facilities with an estimated total of between 754 MW (power tower, dish engine, or photovoltaic [PV] technologies, 9 acres/MW [0.04 km$^2$/MW]) and 1,357 MW (solar trough technologies, 5 acres/MW [0.02 km$^2$/MW]) of electrical power capacity.

Availability of transmission from SEZs to load centers will be an important consideration for future development in SEZs. For the proposed Amargosa Valley SEZ, the nearest existing transmission line as identified in the Draft Solar PEIS is a 138-kV line that runs adjacent to the SEZ. It is possible that this existing line could be used to provide access from the SEZ to the

**TABLE 11.1.1.2-1 Assumed Development Acreages, Solar MW Output, and Nearest Major Access Road and Transmission Line for the Proposed Amargosa Valley SEZ as Revised**

| Total Developable Acreage and Assumed Developed Acreage (80% of Total) | Assumed Maximum SEZ Output for Various Solar Technologies | Distance to Nearest State, U.S., or Interstate Highway | Distance and Capacity of Nearest Existing Transmission Line | Assumed Area of Road ROW | Distance to Nearest Designated Transmission Corridor[e] |
|---|---|---|---|---|---|
| 8,479 acres[a] and 6,783 acres | 754 MW[b] 1,357 MW[c] | U.S. 95: 0 mi[d] | 0 mi and 138 kV | 0 acres and 0 acres | 0 mi |

[a] To convert acres to km$^2$, multiply by 0.004047.

[b] Maximum power output if the SEZ were fully developed using power tower, dish engine, or PV technologies, assuming 9 acres/MW (0.04 km$^2$/MW) of land required.

[c] Maximum power output if the SEZ were fully developed using solar trough technologies, assuming 5 acres/MW (0.02 km$^2$/MW) of land required.

[d] To convert mi to km, multiply by 1.6093.

[e] BLM-designated corridors are developed for federal land use planning purposes only and are not applicable to state-owned or privately owned land.

transmission grid, but the capacity of the existing line would not be adequate for 754 to 1,357 MW of new capacity. Therefore, at full build-out capacity, new transmission lines and possibly upgrades of existing transmission lines would be required to bring electricity from the proposed Amargosa Valley SEZ to load centers. An assessment of the most likely load center destinations for power generated at the Amargosa Valley SEZ and a general assessment of the impacts of constructing and operating new transmission facilities to those load centers are provided in Section 11.1.23. In addition, the generic impacts of transmission lines and associated infrastructure construction and of line upgrades for various resources are discussed in Chapter 5 of this Final Solar PEIS. Project-specific analyses would also be required to identify the specific impacts of new transmission construction and line upgrades for any projects proposed within the SEZ.

Part of the Amargosa Valley SEZ overlaps a locally designated transmission corridor. For this impact assessment, it is assumed that up to 80% of the proposed SEZ could be developed. This does not take into account the potential limitations to solar development that may result from siting constraints associated with the corridor. The development of solar facilities and the existing corridor will be dealt with by the BLM on a case-by-case basis. See Section 11.1.2.2 for further discussion of impacts on lands and realty.

For the proposed Amargosa Valley SEZ, U.S. 95 passes along the northeast boundary of the SEZ. Existing road access to the proposed Amargosa Valley SEZ should be adequate to support construction and operation of solar facilities. No additional road construction outside of the SEZ was assumed to be required to support solar development. While there are existing dirt/ranch roads within the SEZ, additional internal road construction would likely be required to support solar facility construction.

#### 11.1.1.3 Programmatic and SEZ-Specific Design Features

The proposed programmatic design features for each resource area to be required under the BLM Solar Energy Program are presented in Section A.2.2 of Appendix A of this Final Solar PEIS. These programmatic design features are intended to avoid, minimize, and/or mitigate adverse impacts from solar energy development and will be required for development on all BLM-administered lands including SEZ and non-SEZ lands.

The discussions below addressing potential impacts of solar energy development on specific resource areas (Sections 11.1.2 through 11.1.22) also provide an assessment of the effectiveness of the programmatic design features in mitigating adverse impacts from solar development within the SEZ. SEZ-specific design features to address impacts specific to the proposed Amargosa Valley SEZ may be required in addition to the programmatic design features. The proposed SEZ-specific design features for the Amargosa Valley SEZ have been updated on the basis of revisions to the SEZ since the Draft Solar PEIS (such as boundary changes and the identification of non-development areas), and on the basis of comments received on the Draft Solar PEIS and Supplement to the Draft. All applicable SEZ-specific design features identified to date (including those from the Draft Solar PEIS that are still applicable) are presented in Sections 11.1.2 through 11.1.22.

## 11.1.2 Lands and Realty

### 11.1.2.1 Affected Environment

The developable area of the proposed SEZ has been reduced to 8,479 acres (34.3 $km^2$). The northeastern boundary of the proposed SEZ has been moved southwest of Highway 95, and the southwestern boundary has been moved northward a distance of 2.3 to 4.9 mi (3.7 to 7.9 km) from the boundary in the Draft Solar PEIS. Access roads to areas west of the proposed SEZ and a transmission line corridor still pass through the revised proposed SEZ. The proposed SEZ is no longer within the floodplain of the Amargosa River.

### 11.1.2.2 Impacts

Anticipated full development of the proposed SEZ would be reduced from 25,300 acres (102.4 $km^2$) to 6,783 acres (27.4 $km^2$). Since the SEZ is undeveloped and rural, utility-scale solar energy development would be a new and discordant land use to the area. However, solar development of a pending application adjacent to the SEZ could result in altering the regional land use character prior to development in the SEZ.

In the Draft Solar PEIS, it was noted that the proximity of the SEZ to National Park Service (NPS) lands to the southwest and topographic features could result in isolated parcels of public land between the SEZ and the NPS lands. This potential impact is no longer a concern because of the change in SEZ boundaries, moving its southern border well away from NPS lands.

Part of the proposed Amargosa Valley SEZ overlaps a locally designated transmission corridor; this corridor does not currently contain a transmission line. This existing corridor will be used primarily for the siting of transmission lines and other infrastructure such as pipelines. The existing corridor will be the preferred location for any transmission development that is required to support solar development and future transmission grid improvements related to the build-out of the Amargosa Valley SEZ. Any use of the corridor lands within the Amargosa Valley SEZ for solar energy facilities, such as solar panels or heliostats, must be compatible with the future use of the existing corridor. The BLM will assess solar projects in the vicinity of the existing corridor on a case-by-case basis. The BLM will review and approve individual project plans of development to ensure compatible development that maintains the use of the corridor.

### 11.1.2.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on lands and realty are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some mitigation for the identified impacts but would not mitigate all adverse impacts. For example, impacts related to the exclusion of many existing and potential uses of the public land, the visual impact of an industrial-type solar facility within an otherwise rural area, and, should they occur, induced land use changes on state and private lands may not be fully mitigated.

No SEZ-specific design features for lands and realty have been identified. Some SEZ-specific design features may be established for parcels within the Amargosa Valley SEZ through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.1.3 Specially Designated Areas and Lands with Wilderness Characteristics

### 11.1.3.1 Affected Environment

Nine specially designated areas near the proposed Amargosa Valley SEZ that could be affected by solar energy development were discussed in the Draft Solar PEIS: Death Valley NP and Wilderness Area (WA), the California Desert Conservation Area (CDCA), the Ash Meadows National Wildlife Refuge (NWR) and the Devils Hole unit within it, Funeral Mountains WA, Amargosa Mesquite Trees Area of Critical Environmental Concern (ACEC), Amargosa River ACEC, and the Big Dunes ACEC and Special Recreation Management Area (SRMA). The distances to the specially designated areas discussed in this Final Solar PEIS are the same, with the exception of the distance to Death Valley NP and designated wilderness there. The NP boundary now ranges from 5 to 7.5 mi (8 to 12 km) from the boundary of the developable area of the proposed SEZ.

### 11.1.3.2 Impacts

With the increased distance between the National Park and Wilderness Area and the developable area of the potential SEZ, adverse visual impacts on the National Park and designated wilderness will be somewhat reduced though not eliminated. Glint and glare from solar facilities within the SEZ would still be visible from about 3% of the area within the National Park, primarily designated wilderness. The level of potential visual impacts will be affected by the choice of solar technologies employed and mitigation measures applied and will have to be determined on a project-by-project basis. Potential impacts on night sky viewing would also be reduced but not eliminated.

In general, the impacts on the other specially designated areas noted in the Draft Solar PEIS have not changed. Impacts from groundwater withdrawals in the Ash Meadows NWR and Devils Hole unit, Amargosa Mesquite Tree ACEC, and the Amargosa River ACEC would be less than those discussed in the Draft Solar PEIS, because the maximum amount of groundwater use at the SEZ has decreased by about 75% (proportional to the decrease in size of the SEZ). More detailed information on potential water issues is contained in Section 11.1.9 of this Final Solar PEIS and of the Draft Solar PEIS.

#### 11.1.3.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on specially designated areas are described in Section A.2.2 of Appendix A of this Final Solar PEIS (design features for both specially designated areas and visual resources would address impacts). Implementing the programmatic design features will provide some mitigation for the identified impacts. However, some adverse impacts on wilderness characteristics in Death Valley NP and potential impacts on night sky viewing may still occur.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature has been identified:

- Water use for any solar energy development should be reviewed to ensure that impacts on Death Valley NP, the NWR, and ACECs would be neutral or positive.

The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.1.4 Rangeland Resources

#### 11.1.4.1 Livestock Grazing

##### *11.1.4.1.1 Affected Environment*

As presented in the Draft Solar PEIS, no grazing allotments overlap the proposed Amargosa Valley SEZ. The revised area of the SEZ does not alter this finding.

##### *11.1.4.1.2 Impacts*

Because the SEZ does not contain any active grazing allotments, solar energy development within the SEZ would have no impact on livestock and grazing.

##### *11.1.4.1.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Because there is no livestock grazing in the proposed SEZ, no SEZ-specific design features to protect livestock grazing have been identified in this Final Solar PEIS.

#### 11.1.4.2 Wild Horses and Burros

##### *11.1.4.2.1 Affected Environment*

As presented in the Draft Solar PEIS, no wild horse or burro herd management areas (HMAs) occur within the proposed Amargosa Valley SEZ or in close proximity to it. The revised developable area of the SEZ does not alter this finding.

##### *11.1.4.2.2 Impacts*

Solar energy development within the revised area of the proposed Amargosa Valley SEZ would not affect wild horses and burros.

##### *11.1.4.2.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Because solar energy development within the proposed Amargosa Valley SEZ would not affect wild horses and burros, no SEZ-specific design features to address wild horses and burros have been identified in this Final Solar PEIS.

### 11.1.5 Recreation

#### 11.1.5.1 Affected Environment

As stated in the Draft Solar PEIS, off-highway vehicle (OHV) use is likely the major recreational activity in the area of the proposed Amargosa Valley SEZ. A designated route that accommodates desert racing and commercial tours still passes through the SEZ as revised.

#### 11.1.5.2 Impacts

Impacts described in the Draft Solar PEIS are still accurate, although the modified boundary for the proposed SEZ will result in reducing the amount of potential impact on recreational uses. Recreational use would be excluded from any area developed for solar energy production, and the same types of impacts as described in the Draft Solar PEIS would still occur. The route used by desert racing and commercial tours would be adversely affected by solar development within the SEZ. There would be less impact on potential OHV recreation than that described in the Draft Solar PEIS since the area of the SEZ has been reduced. The area removed from the SEZ is designated as “limited to existing roads, trails, and washes” for OHVs and would continue to be available for this use. The most convenient access roads to public lands west of the SEZ still cross within the revised SEZ boundary, and access to those lands could become more difficult.

In addition, lands that are outside of the proposed SEZ may be acquired or managed for mitigation of impacts on other resources (e.g., sensitive species). Managing these lands for mitigation could further exclude or restrict recreational use, potentially leading to additional losses in recreational opportunities in the region. The impact of acquisition and management of mitigation lands would be considered a part of the environmental analysis of specific solar energy projects.

#### 11.1.5.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on recreational are described in Section A.2.2 of Appendix A of this Final Solar PEIS; however, implementing the programmatic design features for recreation will not mitigate the loss of recreational access to public lands developed for solar energy production or the loss of wildlife-related hunting recreation. Implementing the programmatic design features for visual impacts will help minimize recreational impacts of individual solar projects on surrounding areas used by recreationists.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature for recreation has been identified:

- Relocation of the designated route used for desert racing and commercial tours should be considered at the time specific solar development proposals are analyzed.

The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.1.6 Military and Civilian Aviation

#### 11.1.6.1 Affected Environment

Although the area within the proposed SEZ has been reduced, the remaining area is still completely covered by military training routes (MTRs). One of the training routes has an operating elevation from ground level up to 9,400 ft (2,865 m) mean sea level (MSL). The information on affected environment given in the Draft Solar PEIS remains valid.

#### 11.1.6.2 Impacts

Impacts described in the Draft Solar PEIS remain valid and have been updated with additional input from the U.S. Department of Defense (DoD). Impacts include the following:

- MTR airspace is authorized by the Federal Aviation Administration (FAA) and utilized by DoD aircraft from the surface to 9,400 ft MSL. The proposed SEZ encompasses the entire route. Glare and heat emissions produced by certain types of solar technologies may present both flight and ground safety concerns.

- Light from solar energy facilities could affect DoD nighttime operations.

Through comments on the Draft Solar PEIS and the Supplement to the Draft, the DoD expressed concern for solar energy facilities that might affect military test and training operations. The DoD requested that the technology at the proposed Amargosa Valley SEZ be restricted to low-profile, low-glare PV technologies under 50 ft (15 m) above ground level (AGL), similar to the PV I Array at Nellis Air Force Base.

#### 11.1.6.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on military and civilian aviation are described in Section A.2.2 of Appendix A of this Final Solar PEIS. The programmatic design features require early coordination with the DoD to identify and avoid, minimize, and/or mitigate, if possible, potential impacts on the use of military airspace and military testing activities.

No SEZ-specific design features to address impacts on military and civilian aviation have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.1.7 Geologic Setting and Soil Resources

#### 11.1.7.1 Affected Environment

##### *11.1.7.1.1 Geologic Setting*

Data provided in the Draft Solar PEIS remain valid, with the following update:

- The terrain of the proposed Amargosa Valley SEZ slopes gently to the southeast (Figure 11.1.7.1-1). The boundaries of the proposed SEZ have been changed to eliminate the area south and west of the Amargosa River floodplain and the area northeast of U.S. 95. Within this revised area, 1,258 acres (5.1 $km^2$) of Amargosa River floodplain were identified as non-development areas. Based on these changes, the elevations range from about 2,800 ft (850 m) in the northwest corner to about 2,540 ft (775 m) in the southeast corner.

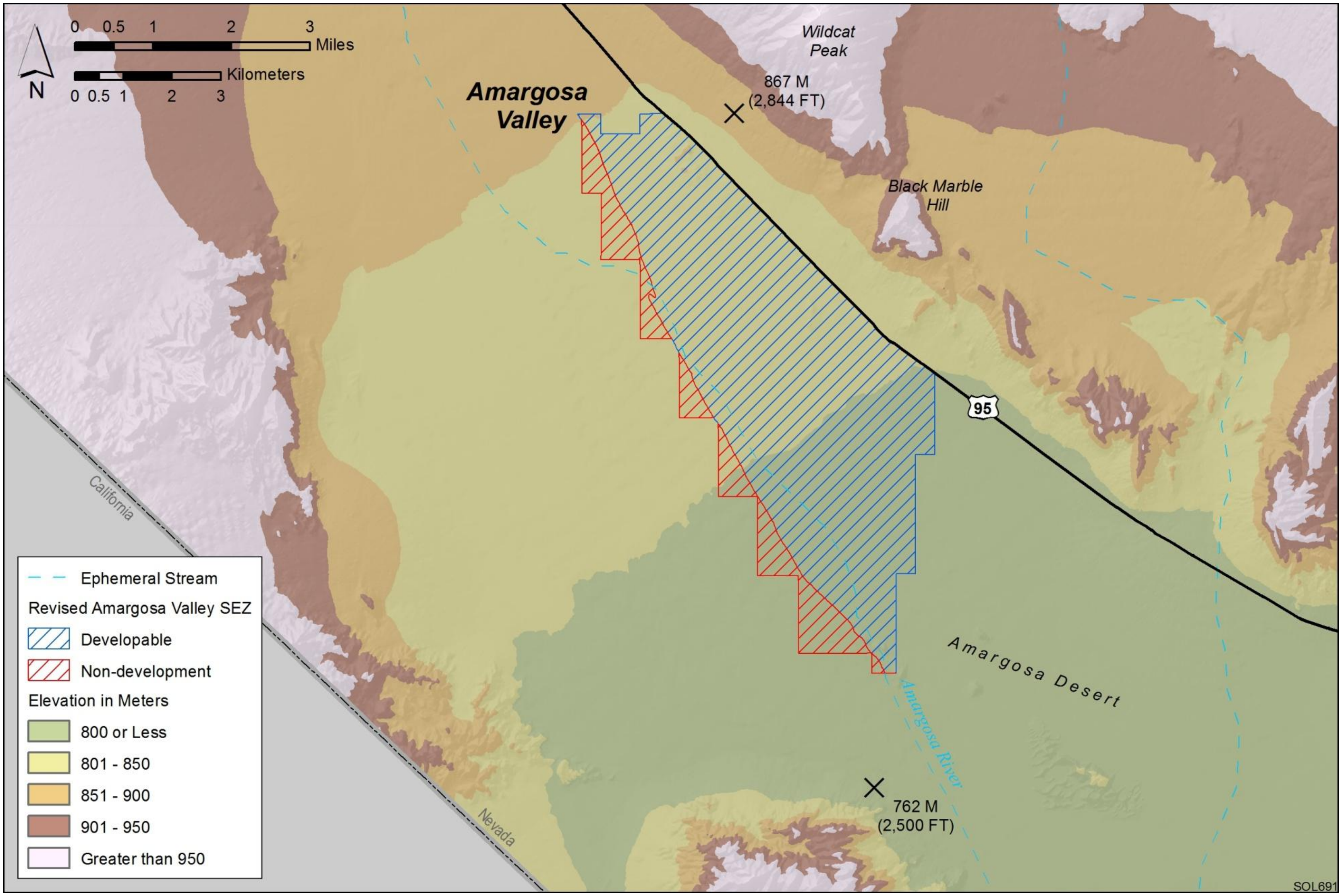


**FIGURE 11.1.7.1-1 General Terrain of the Proposed Amargosa Valley SEZ as Revised**

*11.1.7.1.2 Soil Resources*

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- Soils within the proposed Amargosa Valley SEZ as revised are predominantly the gravelly sandy loams and gravelly loams of the Yermo, hot-Yermo, and Arizo Series, which now make up about 94% of the soil coverage at the site (Table 11.1.7.1-1).

- Soil unit coverage at the proposed Amargosa Valley SEZ as revised is shown in Figure 11.1.7.1-2. The designation of new SEZ boundaries and non-development areas eliminates 17,407 acres (70 $km^2$) of the Yermo, hot–Yermo–Arizo association; 3,883 acres (16 $km^2$) of the Arizo very gravelly sandy loam; 761 acres (3.1 $km^2$) (all) of the Arizo–Crobilt–Commski association; 182 acres (0.74 $km^2$) of the Rock outcrop–Upspring–Rubble land complex; and 768 acres (3.1 $km^2$) of the Yermo–Greyeagle–Arizo association.

**11.1.7.2 Impacts**

Impacts on soil resources would occur mainly as a result of ground-disturbing activities (e.g., grading, excavating, and drilling), especially during the construction phase of a solar project. Because impacts on soil resources result from ground-disturbing activities in the project area, soil impacts would be roughly proportional to the size of a given solar facility, with larger areas of disturbed soil having a greater potential for impacts than smaller areas (Section 5.7.2). The assessment provided in the Draft Solar PEIS remains valid, with the following update:

- Impacts related to wind erodibility are reduced because the identification of new SEZ boundaries and non-development areas eliminates 22,188 acres (90 $km^2$) of moderately erodible soils from development.

**11.1.7.3 SEZ-Specific Design Features and Design Feature Effectiveness**

Required programmatic design features that would reduce impacts on soils are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will reduce the potential for soil impacts during all project phases.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for soil resources were identified at the Amargosa Valley SEZ. Some SEZ-specific design features may ultimately be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

**TABLE 11.1.7.1-1 Summary of Soil Map Units within the Proposed Amargosa Valley SEZ as Revised**

| Map Unit Symbol | Map Unit Name | Erosion Potential | | Description | Area in Acres[c] (percentage of SEZ) |
|---|---|---|---|---|---|
| | | Water[a] | Wind[b] | | |
| 2054 | Yermo, hot–Yermo–Arizo association (2 to 4% slopes) | Low (0.05) | Moderate (WEG 5)[d] | Consists of about 30% Yermo stratified extremely gravelly sandy loam to gravelly loam, 40% hot-Yermo very gravelly sandy loam, and 15% Arizo very gravelly sandy loam. Level to nearly level soils on inset fans and fan remnants. Parent material is alluvium from mixed sources. Deep to very deep and well to excessively drained, with moderate surface-runoff potential and moderately rapid to very rapid permeability. Available water capacity is low. Slight rutting hazard. Used mainly as rangeland and wildlife habitat; unsuitable for cultivation. | 8,068 (82.9)[e] |
| 2152 | Arizo very gravelly sandy loam, moist (0 to 2% slopes) | Low (0.10) | Moderate (WEG 5) | Level to nearly level soils on inset fans and floodplains. Parent material is alluvium from mixed sources. Deep to very deep, well to excessively drained, with low surface-runoff potential (high infiltration rate) and rapid to very rapid permeability. Available water capacity is low. Slight rutting hazard. Used mainly as rangeland and wildlife habitat; unsuitable for cultivation. | 656 (6.7)[f] |
| 2393 | Commski–Yermo association | Low (0.15) | Moderate (WEG 5) | Consists of 70% Commski very gravelly fine sandy loam and 25% Yermo stratified extremely gravelly sandy loam to gravelly loam. Nearly level soils formed on inset fans and fan remnants. Parent material consists of alluvium derived from mixed sources, including limestone and dolomite. Moderately deep and well drained, with moderate surface runoff potential and moderate to very rapid permeability Low resistance to compaction. Available water capacity is high. Slight rutting hazard. Used mainly as rangeland and wildlife habitat; unsuitable for cultivation. | 458 (4.7) |

**TABLE 11.1.7.1-1 (Cont.)**

| Map Unit Symbol | Map Unit Name | Erosion Potential Water[a] | Erosion Potential Wind[b] | Description | Area in Acres[c] (percentage of SEZ) |
|---|---|---|---|---|---|
| 2151 | Arizo–Bluepoint–Dune land complex (0 to 4% slopes) | Low (0.10) | Moderate (WEG 5) | Consists of 40% Arizo very gravelly sandy loam, 35% Bluepoint loamy fine sand, and 15% Dune land fine sand. Level to nearly level soils on inset fans, sand sheets, and dunes. Parent material consists of alluvium from mixed sources and eolian sands. Deep to very deep and somewhat excessively to excessively drained, with low surface-runoff potential (high infiltration rate) and rapid to very rapid permeability. Available water capacity is low. Moderate rutting hazard. Used mainly as rangeland and wildlife habitat; unsuitable for cultivation. | 415 (1)[g] |
| 2020 | Weiser–Canoto association | Low (0.15) | Moderate (WEG 5) | Consists of 70% Weiser extremely gravelly loam and 25% Canoto very gravelly sandy loam. Nearly level soils on fan remnants. Parent material consists of alluvium from limestone and dolomite. Very deep and well drained, with moderate infiltration and moderate to moderately rapid permeability. Available water capacity is low. Slight rutting hazard. Used mainly as rangeland, forestland, and wildlife habitat; unsuitable for cultivation. | 57 (<1) |
| 2002 | Rock outcrop-Upspring–Rubble land complex (8 to 75% slopes) | Not rated | Not rated | Consists of 45% rock outcrop, 30% Upspring very gravelly sandy loam, and 15% rubble land fragments. Steeply sloping soils on hills. Very shallow and somewhat excessively to excessively drained. Parent material (Upspring) consists of colluvium from volcanic rocks over residuum weathered from volcanic rocks. Available water capacity is very low. Slight rutting hazard. Upspring soils used mainly for watershed, wildlife habitat, and recreation land. | 46 (<1)[h] |

**TABLE 11.1.7.1-1 (Cont.)**

| Map Unit Symbol | Map Unit Name | Erosion Potential Water[a] | Erosion Potential Wind[b] | Description | Area in Acres[c] (percentage of SEZ) |
|---|---|---|---|---|---|
| 2053 | Yermo–Greyeagle–Arizo association | Low (0.05) | Moderate (WEG 5) | Consists of 60% Yermo stratified extremely gravelly sandy loam to gravelly loam, 20% Greyeagle very gravelly sandy loam, and 15% Arizo very stony sandy loam. Sloping soils on alluvial fans, inset fans, and fan remnants. Parent material consists of alluvium from mixed sources. Shallow to moderately deep and well to excessively drained, with moderate surface runoff potential and moderately rapid to very rapid permeability. Available water capacity is very low to low. Slight rutting hazard. Used mainly as rangeland, wildlife habitat, and recreation land; unsuitable for cultivation. | 36 (<1) |

[a] Water erosion potential rates based on soil erosion factor K, which indicates the susceptibility of soil to sheet and rill erosion by water. Values range from 0.02 to 0.69 and are provided in parentheses under the general rating; a higher value indicates a higher susceptibility to erosion. Estimates based on the percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity.

[b] Wind erosion potential here is based on the wind erodibility group (WEG) designation: groups 1 and 2, high; groups 3 through 6, moderate; and groups 7 and 8, low (see footnote d for further explanation).

[c] To convert acres to $km^2$, multiply by 0.004047.

[d] WEGs are based on soil texture, content of organic matter, effervescence of carbonates, content of rock fragments, and mineralogy, and also take into account soil moisture, surface cover, soil surface roughness, wind velocity and direction, and the length of unsheltered distance (USDA 2004). Groups range in value from 1 (most susceptible to wind erosion) to 8 (least susceptible to wind erosion). The NRCS provides a wind erodibility index, expressed as an erosion rate in tons per acre per year, for each of the wind erodibility groups: WEG 5, 56 tons (51 metric tons) per acre (4,000 $m^2$) per year.

[e] A total of 674 acres (2.7 $km^2$) within the Yermo, hot–Yermo–Arizo association is currently categorized as a non-development area (denoted by red areas in Figure 11.1.7.1-2).

[f] A total of 578 acres (2.3 $km^2$) within the Arizo very gravelly sandy loam is currently categorized as a non-development area (denoted by red areas in Figure 11.1.7.1-2).

**Footnotes continued on next page.**

1

## TABLE 11.1.7.1-1 (Cont.)

[g] A total of 4 acres (0.016 $km^2$) within the Arizo–Bluepoint–Dune land complex is currently categorized as a non-development area (denoted by red areas in Figure 11.1.7.1-2).

[h] A total of 2 acres (0.008 $km^2$) within the Rock Outcrop–Upspring-Rubble land complex is currently categorized as a non-development area (denoted by red areas in Figure 11.1.7.1-2).

Source: NRCS (2010).

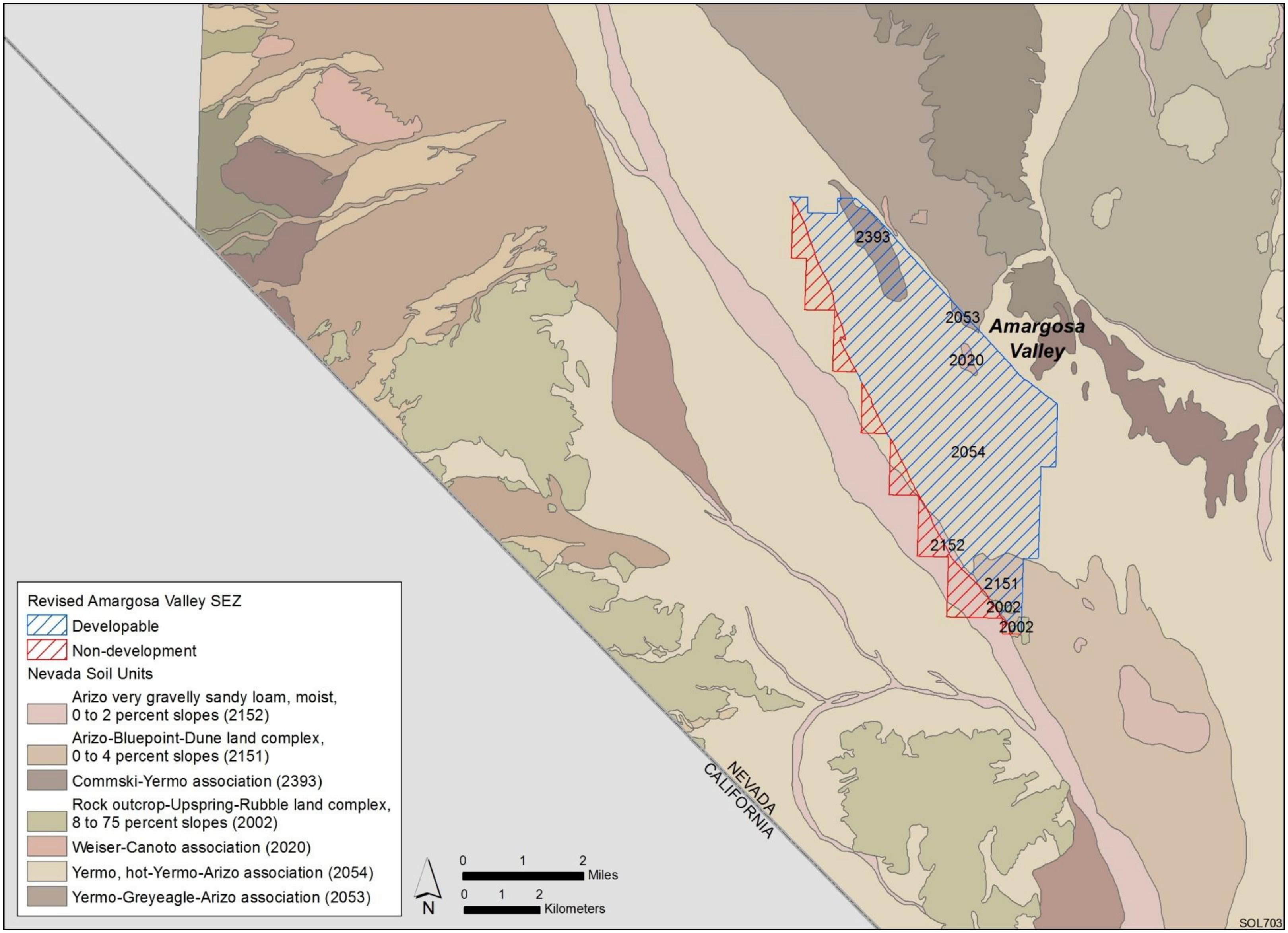


**FIGURE 11.1.7.1-2 Soil Map for the Proposed Amargosa Valley SEZ as Revised (NRCS 2008)**

## 11.1.8 Minerals (Fluids, Solids, and Geothermal Resources)

A mineral potential assessment for the proposed Amargosa Valley SEZ has been prepared and reviewed by BLM mineral specialists knowledgeable about the region where the SEZ is located (BLM 2012a). The BLM is proposing to withdraw the SEZ from settlement, sale, location, or entry under the general land laws, including the mining laws, for a period of 20 years (see Section 2.2.2.2.4 of the Final Solar PEIS). The potential impacts of this withdrawal are discussed in Section 11.1.24.

### 11.1.8.1 Affected Environment

The description in the Draft Solar PEIS remains valid. There are no mining claims located in the proposed Amargosa Valley SEZ (as of September 2010). The land of the SEZ was closed to locatable mineral entry in June 2009; however, the area remains open for discretionary mineral leasing for oil and gas and other leasable minerals and for disposal of salable minerals.

### 11.1.8.2 Impacts

The description in the Draft Solar PEIS remains valid. If the area is identified as an SEZ, it will continue to be closed to all incompatible forms of mineral development. Since the SEZ does not contain existing mining claims, it is assumed there would be no future loss of locatable mineral production. Some future development of oil and gas resources beneath the SEZ would be possible, and production of common minerals could take place in areas not directly developed for solar energy production.

### 11.1.8.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on mineral resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide adequate protection of mineral resources.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features to address impacts on minerals have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.1.9 Water Resources

### 11.1.9.1 Affected Environment

The overall size of the proposed Amargosa Valley SEZ has been reduced by 69% from the area described in the Draft Solar PEIS, resulting in a total area of 9,737 acres (39.4 km$^2$). The description of the affected environment given in the Draft Solar PEIS relevant to water resources at the proposed Amargosa Valley SEZ remains valid and is summarized in the following paragraphs.

The Amargosa Valley SEZ is within the Northern Mojave–Mono Lake subbasin of the California hydrologic region. The SEZ is located near the bottom of Bare Mountain, with the Funeral Mountains to the south and the Grapevine Mountains to the west. The average precipitation and snowfall is about 4 in./yr (10 cm/yr) and 3 in./yr (8 cm/yr), respectively, and the estimated pan evaporation rate is about 93 in./yr (236 cm/yr). There are no perennial surface water features within the SEZ. The Amargosa River is a wide feature of braided, intermittent stream channels that flows from the northwest to the southeast though the valley. Several unnamed intermittent/ephemeral washes run from northwest to southeast through the SEZ. The 100-year floodplain of the Amargosa River forms the southwestern boundary of the SEZ; 1,258 acres (5.1 $km^2$) are identified as non-development areas and fall within the floodplain. Most of the SEZ is classified as having minimal to moderate flood hazard potential and is within a 500-year floodplain. Several important surface water features within the Amargosa Valley are located to the south and southeast of the SEZ and include the wetland, streams, and springs associated with Ash Meadows NWR, Devils Hole, and Death Valley NP, as well as the wild and scenic river reach of the Amargosa River located 56 mi (90 km) to the southeast in California.

The Amargosa Valley SEZ is part of the Amargosa Desert groundwater basin, where the groundwater resources consist of a basin-fill aquifer composed of river channel, playa, alluvial fan, freshwater limestone, and conglomerate deposits of fine-grained material (playa and limestone units) to well-sorted clays to gravels (river channel, alluvial fan, and conglomerate units). The basin-fill aquifer in the northern portion of the Amargosa Desert groundwater basin in the vicinity of the SEZ is approximately 1,500 ft (457 m) thick and is underlain by non-carbonate bedrock material. The southern portion of the Amargosa Desert groundwater basin is underlain by carbonate rock aquifers that are a part of the regional-scale carbonate rock province that covers a large portion of eastern Nevada and western Utah. Groundwater flow in the basin-fill aquifer in the northern portion of the Amargosa Desert groundwater basin is from the northwest to the southeast with groundwater surface elevations ranging from 2,349 to 2,470 ft (716 to 753 m). Complex faulting occurs near the transition of non-carbonate bedrock to the carbonate rock province, which creates a juxtaposition between low-permeability basin-fill deposits and the highly permeable carbonate rock aquifers near the vicinity of the Ash Meadows NWR. The carbonate rock aquifers in the vicinity of the Ash Meadows NWR are a part of an interbasin groundwater system that flows from northeast to southwest and discharges to numerous springs within the Ash Meadows NWR and the collapsed limestone cavern and geothermal pool at Devils Hole. Historical groundwater withdrawals in the basin-fill aquifers of the Amargosa Desert groundwater basin have been linked to water level declines at Devils Hole and springs within the Ash Meadows NWR, which demonstrates the connectivity between the basin-fill and carbonate rock aquifers. Groundwater recharge occurs primarily from mountain front recharge ranging from 600 to 1,200 ac-ft/yr (740,000 to 1.5 million $m^3$/yr), infiltration from the Amargosa River on the order of 90 ac-ft/yr (111,000 $m^3$/yr), and discharge from the carbonate rock aquifers, with estimates ranging from 19,000 to 44,000 ac-ft/yr (23.4 million to 54.3 million $m^3$/yr). Evapotranspiration rates in the Amargosa Desert groundwater basin from phreatophytes, bare soils, and surface springs are on the order of 17,000 to 24,000 ac-ft/yr

(21 million to 29.6 million $m^3$/yr). Groundwater quality varies in the Amargosa Desert Valley but is generally good except for elevated total dissolved solids (TDS), arsenic, fluoride, and sulfate concentrations.

All waters in Nevada are public property and the Nevada Division of Water Resources (NDWR) is the agency responsible for managing both surface and groundwater resources. The Amargosa Desert Basin is overallocated, with its perennial yield set at 24,000 ac-ft/yr (29.6 million $m^3$/yr), of which 17,000 ac-ft/yr (21 million $m^3$/yr) is committed to the USFWS and more than 25,000 ac-ft/yr (30.8 million $m^3$/yr) to beneficial uses. In 2009, the actual amount of groundwater withdrawals totaled 16,380 ac-ft/yr (22 million $m^3$/yr). Groundwater management in the Amargosa Desert groundwater basin is largely affected by the U.S. Supreme Court Decision of *Cappaert v. U.S.* (1976), State Engineer's Order 724 (NDWR 1979), State Engineer's Ruling 5750 (NDWR 2007), and State Engineer's Order 1197 (NDWR 2008). These water management decisions were initiated in 1979 to protect the USFWS's senior water right, which is used to protect spring discharges in the Ash Meadows NWR and Devils Hole; the latest Order 1197 (NDWR 2008) stated that new water right applications in the Amargosa Desert Basin would be denied, as would any application seeking to change the point of diversion closer to Devils Hole defined by a 25-mi (40-km) radius around Devils Hole. Solar developers seeking water rights in the Amargosa Desert groundwater basin will have to purchase and transfer existing water rights. In addition, given the overallocated status of the basin and critical groundwater dependency of the Ash Meadows NWR and Devils Hole, it is likely that water right transfers would have to be moved away from Devils Hole and possibly include the transfer and retirement of water rights to help alleviate the overallocation of the basin.

In addition to the water resources information provided in the Draft Solar PEIS, this section provides a planning-level inventory of available climate, surface water, and groundwater monitoring stations within the immediate vicinity of the Amargosa Valley SEZ and surrounding basin. Additional data regarding climate, surface water, and groundwater conditions are presented in Tables 11.1.9.1-1 through 11.1.9.1-7 and in Figures 11.1.9.1-1 and 11.1.9.1-2. Fieldwork and hydrologic analyses to determine jurisdictional water bodies would need to be coordinated with appropriate federal, state, and local agencies. Areas within the Amargosa Valley SEZ determined to be jurisdictional will be subject to the permitting process described in the Clean Water Act (CWA).

### 11.1.9.2 Impacts

#### *11.1.9.2.1 Land Disturbance Impacts on Water Resources*

The discussion of land disturbance effects on water resources in the Draft Solar PEIS remains valid. As stated in the Draft Solar PEIS, land disturbance impacts in the vicinity of the Amargosa Valley SEZ could potentially affect drainage patterns, intermittent flows in the Amargosa River, ecological habitats, and groundwater recharge processes. The alteration of natural drainage pathways during construction can lead to impacts related to flooding, loss of water delivery to downstream regions, and alterations to riparian vegetation and habitats. The

**TABLE 11.1.9.1-1 Watershed and Water Management Basin Information Relevant to the Proposed Amargosa Valley SEZ as Revised**

| Basin | Name | Area (acres)[b] |
|---|---|---|
| Subregion (HUC4)[a] | Northern Mojave–Mono Lake (1809) | 18,088,041 |
| Cataloging unit (HUC8) | Upper Amargosa (18090202) | 2,163,114 |
| Groundwater basin | Amargosa Desert | 573,440 |
| SEZ | Amargosa Valley | 9,737 |

[a] HUC = Hydrologic Unit Code; a USGS system for characterizing nested watersheds that includes large-scale subregions (HUC4) and small-scale cataloging units (HUC8).

[b] To convert acres to $km^2$, multiply by 0.004047.

change in the SEZ boundaries and identification of non-development areas has removed regions of the Amargosa River and its associated 100-year floodplain from the SEZ, which reduces the potential for adverse impacts.

Land clearing, land leveling, and vegetation removal during the development of the SEZ have the potential to disrupt intermittent/ephemeral stream channels. Several programmatic design features described in Section A.2.2 of Appendix A of this Final Solar PEIS would avoid, minimize, and/or mitigate impacts associated with the disruption of intermittent/ephemeral water features. Additional analyses of intermittent/ephemeral streams are presented in this update, including an evaluation of functional aspects of stream channels with respect to groundwater recharge, flood conveyance, sediment transport, geomorphology, and ecological habitats. Only a summary of the results from these surface water analyses is presented in this section; more information on methods and results is presented in Appendix O.

The study region considered for the intermittent/ephemeral stream evaluation relevant to the Amargosa Valley SEZ is a subset of the Upper Amargosa watershed (HUC8), for which information regarding stream channels is presented in Tables 11.1.9.1-3 and 11.1.9.1-4 of this Final Solar PEIS. The results of the intermittent/ephemeral stream evaluation are shown in Figure 11.1.9.2-1, which depicts flow lines from the National Hydrography Dataset (USGS 2012a) labeled as having low, moderate, and high sensitivity to land disturbance. Within the study area, 8% of the intermittent/ephemeral stream channels had low sensitivity, 79% had moderate sensitivity, and 13% had high sensitivity to land disturbance. Of the stream channels located within the SEZ, the majority were classified as moderately sensitive, with a few highly sensitive reaches located along the Amargosa River and along the northern boundary of the SEZ (Figure 11.1.9.2-1).

**TABLE 11.1.9.1-2 Climate Station Information Relevant to the Proposed Amargosa Valley SEZ as Revised**

| Climate Station (COOP ID[a]) | Elevation[b] (ft)[c] | Distance to SEZ (mi)[d] | Period of Record | Mean Annual Precipitation (in.)[e] | Mean Annual Snowfall (in.) |
|---|---|---|---|---|---|
| Amargosa Farms Garey, Nevada (260150) | 2,450 | 15 | 1965–2011 | 4.40 | 0.30 |
| Beatty, Nevada (260714) | 3,304 | 14 | 1917–1972 | 4.24 | 3.40 |
| Lathrop Wells 16 SSE, Nevada | 2,182 | 27 | 1970–1977 | 3.37 | 0 |

[a] National Weather Service's Cooperative Station Network station identification code.

[b] Surface elevations for the proposed Amargosa Valley SEZ range from 2,500 to 2,825 ft.

[c] To convert ft to m, multiply by 0.3048.

[d] To convert mi to km, multiply by 1.6093.

[e] To convert in. to cm, multiply by 2.540.

Source: NOAA (2012).

**TABLE 11.1.9.1-3 Total Lengths of Selected Streams at the Subregion, Cataloging Unit, and SEZ-scale Relevant to the Proposed Amargosa Valley SEZ as Revised**

| Water Feature | Subregion, HUC4 (ft)[a] | Cataloging Unit, HUC8 (ft) | SEZ (ft) |
|---|---|---|---|
| Unclassified streams | 60,802 | 0 | 0 |
| Perennial streams | 12,296,888 | 353,101 | 0 |
| Intermittent/ephemeral streams | 334,367,739 | 42,604,594 | 239,371 |
| Canals | 2,932,127 | 206,939 | 0 |

[a] To convert ft to m, multiply by 0.3048.

Source: USGS (2012a).

**TABLE 11.1.9.1-4 Stream Discharge Information Relevant to the Proposed Amargosa Valley SEZ as Revised**

| | Monitoring Station (USGS ID) | | |
|---|---|---|---|
| Parameter | Amargosa River near Beatty, Nevada (10251220) | Carson Slough at Ash Meadows, Nevada (10251275) | Big Spring (362230116162001) |
| Period of record | 1993–2000 | 1993–1997 | 1916–1993 |
| No. of observations | 3 | 34 | 94 |
| Discharge, median ($ft^3/s$)[a] | 0.422 | 1.05 | 2.08 |
| Discharge, range ($ft^3/s$) | 0.03–40 | 0.019–7.93 | 1.51–2.49 |
| Discharge, most recent observation ($ft^3/s$) | 40 | 0.019 | 2.23 |
| Distance to SEZ (mi)[b] | 12 | 26 | 32 |

[a] To convert $ft^3$ to $m^3$, multiply by 0.0283.

[b] To convert mi to km, multiply by 1.6093.

Source: USGS (2012b).

### *11.1.9.2.2 Water Use Requirements for Solar Energy Technologies*

Changes to the Amargosa Valley SEZ boundaries resulted in a reduction in the estimated water use requirements (Table 11.1.9.2-1). This section examines the updated water use estimates relative to additional analyses of groundwater resources. The additional analyses of groundwater include a basin-scale groundwater budget and a simplified, one-dimensional groundwater model of potential groundwater drawdown. Only a summary of the results from these groundwater analyses is presented in this section; more information on methods and results is presented in Appendix O.

**TABLE 11.1.9.1-5 Surface Water Quality Data Relevant to the Proposed Amargosa Valley SEZ as Revised**

| | Station (USGS ID)[a] | | |
|---|---|---|---|
| Parameter | 10251220 | 362230116162001 | 361910116224201 |
| Period of record | 1993 | 1987–1996 | 1988–1993 |
| No. of records | 1 | 6 | 3 |
| Temperature (°C)[b] | NA[c] | 27.5 (27–31.5) | 9.5 (8–11) |
| Turbidity (nephelometric turbidity units) | NA | 0.6 (0.4–2) | NA |
| Dissolved oxygen (mg/L) | NA | 3.8 | NA |
| pH | NA | 7.4 (7.3–7.5) | NA |
| Total nitrogen (mg/L) | NA | 0.38 (0.32–0.44) | NA |
| Phosphorus (mg/L as P) | NA | 0.01 | NA |
| Organic carbon (mg/L) | NA | 0.4 (0.1–0.5) | NA |
| Calcium (mg/L) | 32 | 43 (41–44) | 19 (9–20) |
| Magnesium (mg/L) | 5.3 | 18 (18–19) | 17 (6.7–51) |
| Sodium (mg/L) | 540 | 96 (93–100) | 310 (210–650) |
| Chloride (mg/L) | 230 | 27 (23–31) | 150 (84–250) |
| Sulfate (mg/L) | 360 | 110 (110–120) | 390 (210–780) |
| Arsenic (µg/L) | NA | 27 (3–29) | NA |

[a] Median values are listed; the range in values is shown in parentheses.

[b] To convert °C to °F, multiply by 1.8, then add 32.

[c] NA = no data collected for this parameter.

Source: USGS (2012b).

The estimated total water use requirements during the peak construction year are as high as 1,629 ac-ft/yr (2 million m$^3$/yr). The total annual water requirements for operations were categorized as low, medium, and high groundwater pumping scenarios that represent full build-out of the SEZ assuming PV, dry-cooled parabolic trough, and wet-cooled parabolic trough, respectively (a 30% operational time was considered for all the solar facility types on the basis of operations estimates for proposed utility-scale solar energy facilities). This categorization results in water use estimates that range from 39 to 6,802 ac-ft/yr (48,100 to 8.4 million m$^3$/yr), or a total of 780 to 136,040 ac-ft (962,100 to 168 million m$^3$) over the 20-year analysis period.

A basin-scale groundwater budget was assembled by using available data on groundwater inputs, outputs, and storage (Table 11.1.9.2-2) for comparison with water use estimates relating to solar energy development. The groundwater budget includes the perennial yield value set by the NDWR in order to guide water right allocations. The peak construction year water requirements represent 4% of the total groundwater inputs and 7% of the perennial yield of the Amargosa Desert Basin. Given the short duration of construction activities, impacts associated with the construction water demand are considered minimal. The long duration of groundwater pumping during operations (20 years) poses a greater threat to groundwater resources. The high

**TABLE 11.1.9.1-6 Water Quality Data from Groundwater Samples Relevant to the Proposed Amargosa Valley SEZ as Revised**

| | Station (USGS ID)[a] | | |
|---|---|---|---|
| Parameter | 363835116234001 | 364556116413501 | 362835116264102 |
| Period of record | 1991–1998 | 1989–1999 | 1992–1998 |
| No. of records | 12 | 3 | 10 |
| Temperature (°C)[b] | 26 (25–28.5) | 28.5 | 23.5 (22–31) |
| Total dissolved solids (mg/L) | 376 (367–385) | NA | 254 (252–256) |
| Dissolved oxygen (mg/L) | 5.5 (5.1–5.7) | 5.4 | 5.6 (5.4–5.9) |
| pH | 8 (7.8–8.1) | 7.5 | 8 (7.8–8.1) |
| Nitrate + nitrite (mg/L as N) | 2.17 (2.1–2.2) | 0.22 | 1.64 (1.6–1.68) |
| Phosphate (mg/L) | < 0.031 | 0.061 | < 0.031 |
| Organic carbon (mg/L) | NA[c] | 0.8 | NA |
| Calcium (mg/L) | 16.5 (16–17.1) | 47.8 (47–48.5) | 18.8 (18.5–19) |
| Magnesium (mg/L) | 0.82 (0.8–0.83) | 17.95 (17.9–18) | 2.17 (2.14–2.2) |
| Sodium (mg/L) | 100.5 (97–110) | 161 (160–162) | 41.5 (41–42) |
| Chloride (mg/L) | 14 (12.7–16) | 79.8 (79–80.6) | 8.21 (7.22–9.2) |
| Sulfate (mg/L) | 110 (109–110) | 194 (190–198) | 30.6 (28.2–33) |
| Arsenic (mcg/L) | 21.5 (8–22) | 5 | 11 |
| Fluoride (mg/L) | 1.9 (1.79–2) | 3.19 (2.98–3.4) | 1.64 (1.59–1.7) |
| Uranium, natural (µg/L) | 0.89 | NA | 0.3 |
| Radon-222 (pCi/L) | 30 (28–32) | 31 | 31 (26–36) |

[a] Median values are listed; the range in values is shown in parentheses.

[b] To convert °C to °F, multiply by 1.8, then add 32.

[c] NA = no data collected for this parameter.

Source: USGS (2012b).

pumping scenario represents 15% of the annual groundwater inputs to the basin and 6% of the storage in the basin-fill aquifer over the 20-year analysis period. The medium pumping scenario represents 2% of the annual groundwater inputs to the basin and 1% of the storage in the basin fill aquifer over the 20-year analysis period. The low pumping scenario is negligible in comparison to the groundwater budget components in the Amargosa Desert Basin.

Groundwater budgeting allows for quantification of complex groundwater processes at the basin scale, but it ignores the temporal and spatial components of how groundwater withdrawals affect groundwater surface elevations, groundwater flow rates, and connectivity to surface water features such as streams, wetlands, playas, and riparian vegetation. A one-dimensional groundwater modeling analysis was performed to present a simplified depiction of the spatial and temporal effects of groundwater withdrawals by examining groundwater drawdown in a radial direction around the center of the SEZ for the low, medium, and high pumping scenarios. A detailed discussion of the groundwater modeling analysis is presented in Appendix O. Note, however, that the aquifer parameters used for the one-dimensional

**TABLE 11.1.9.1-7 Groundwater Surface Elevations Relevant to the Proposed Amargosa Valley SEZ as Revised**

| | Station (USGS ID) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 362425116181001 | 362532116172700 (Devils Hole) | 363310116294001 | 363317116270801 | 364141116351402 | 364246116445701 | 364600116410901 |
| Period of record | 1969–2011 | 1937–2009 | 1953–2011 | 1995–2011 | 1986–2011 | 1986–2011 | 1988–2006 |
| No. of observations | 90 | 690 | 292 | 59 | 215 | 86 | 62 |
| Surface elevation (ft)[a] | 2,248 | 2,360 | 2,376 | 2,396 | 2,628 | 2,730 | 2,772 |
| Well depth (ft) | 280 | NA[c] | 348 | 1,859 | 320 | 1,400 | 324 |
| Depth to water, median (ft) | 19.96 | 2.15 | 128.54 | 123.84 | 269.77 | 281.9 | 301 |
| Depth to water, range (ft) | 18–29.8 | 0.95–3.8 | 103–144.59 | 119.04–128.55 | 269.36–270.45 | 280.4–282.2 | 300–307 |
| Depth to water, most recent observation (ft) | 20.25 | 2.03 | 144.59 | 128.55 | 270.45 | 282.03 | 302 |
| Distance to SEZ (mi)[b] | 29 | 29 | 14 | 16 | 3 | 5 | 4 |

[a] To convert ft to m, multiply by 0.3048.

[b] To convert mi to km, multiply by 1.6093.

[c] NA = data not available for this parameter.

Source: USGS (2012b).

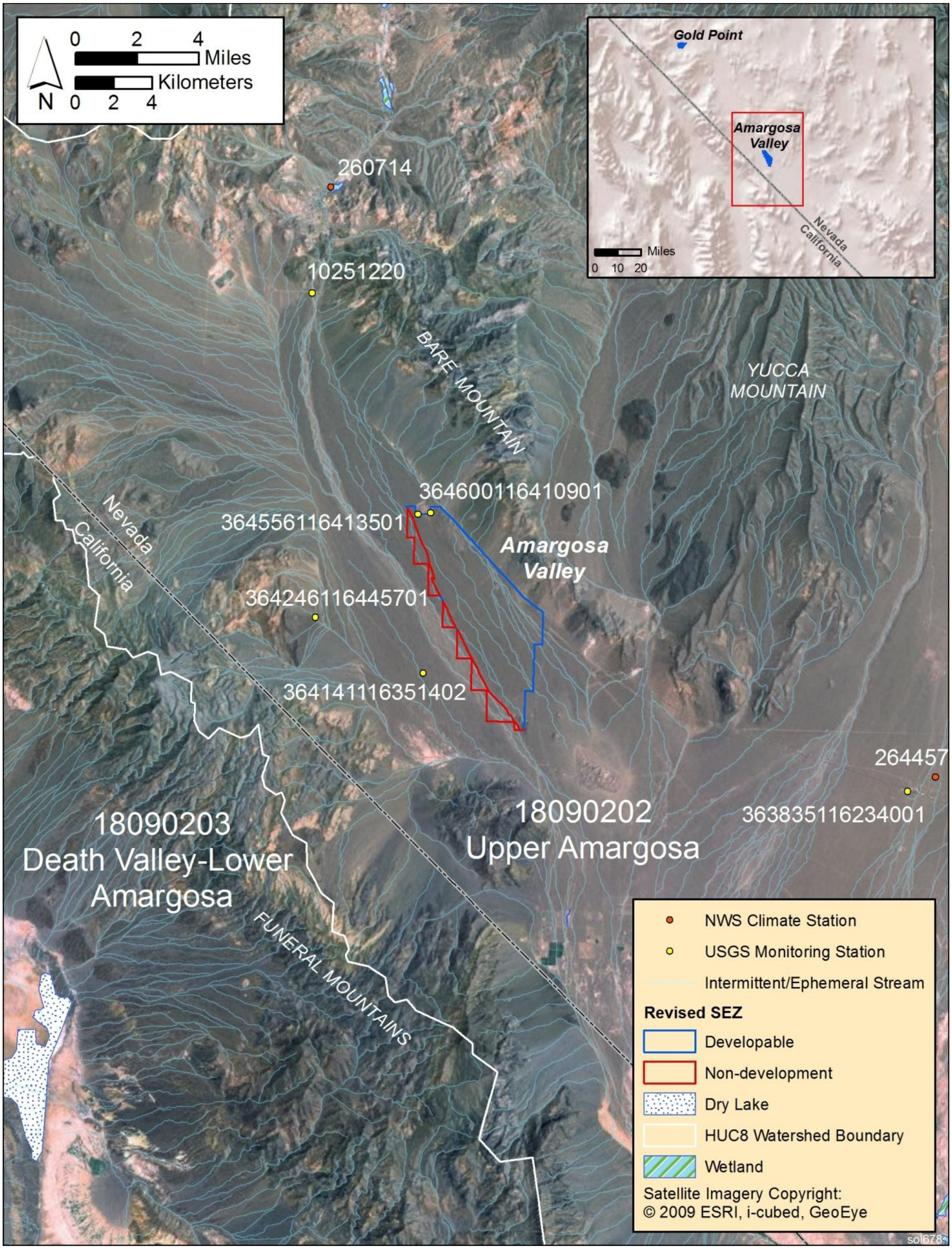


**FIGURE 11.1.9.1-1 Water Features near the Proposed Amargosa Valley SEZ as Revised**

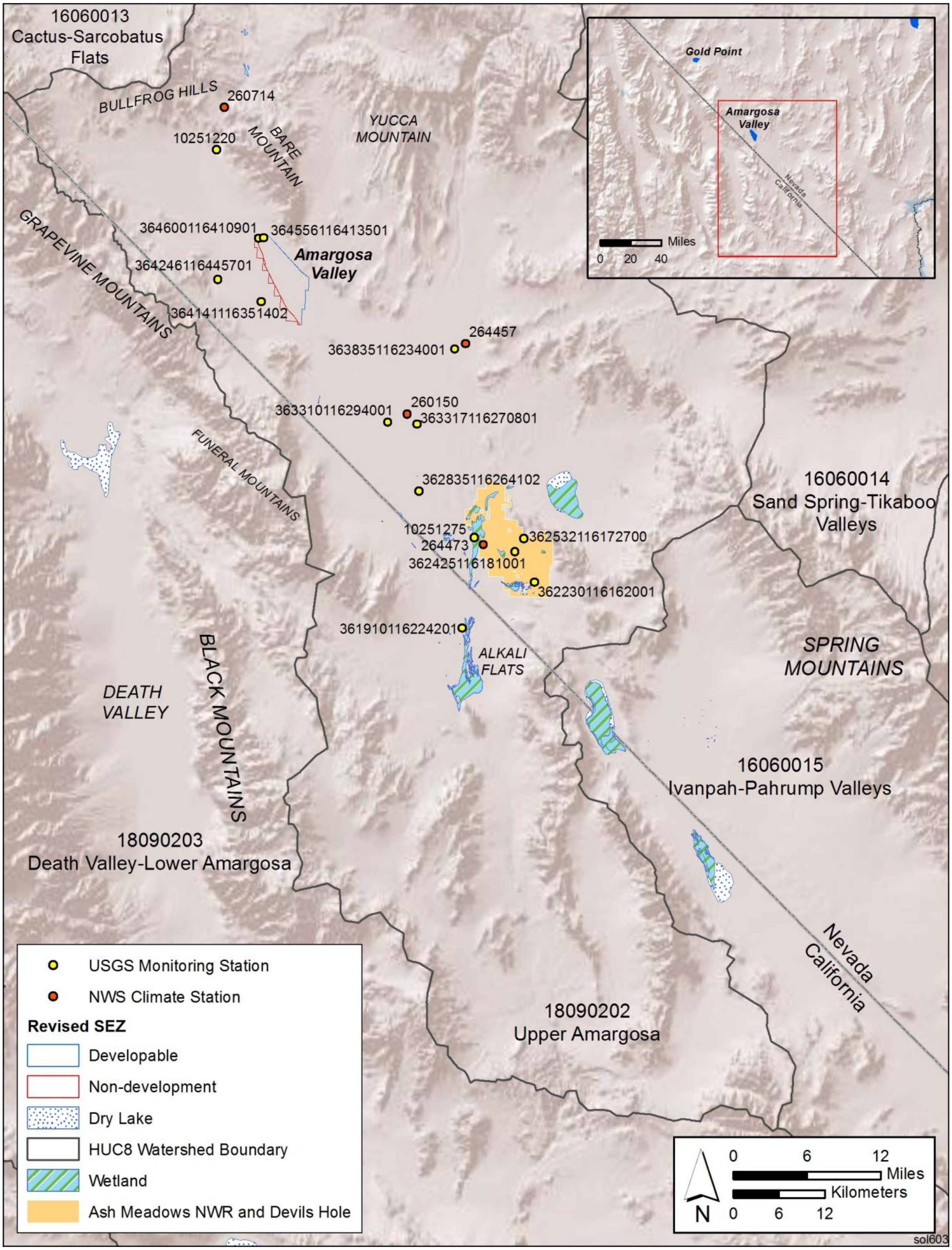


**FIGURE 11.1.9.1-2 Water Features within the Upper Amargosa Watershed, Which Includes the Proposed Amargosa Valley SEZ as Revised**

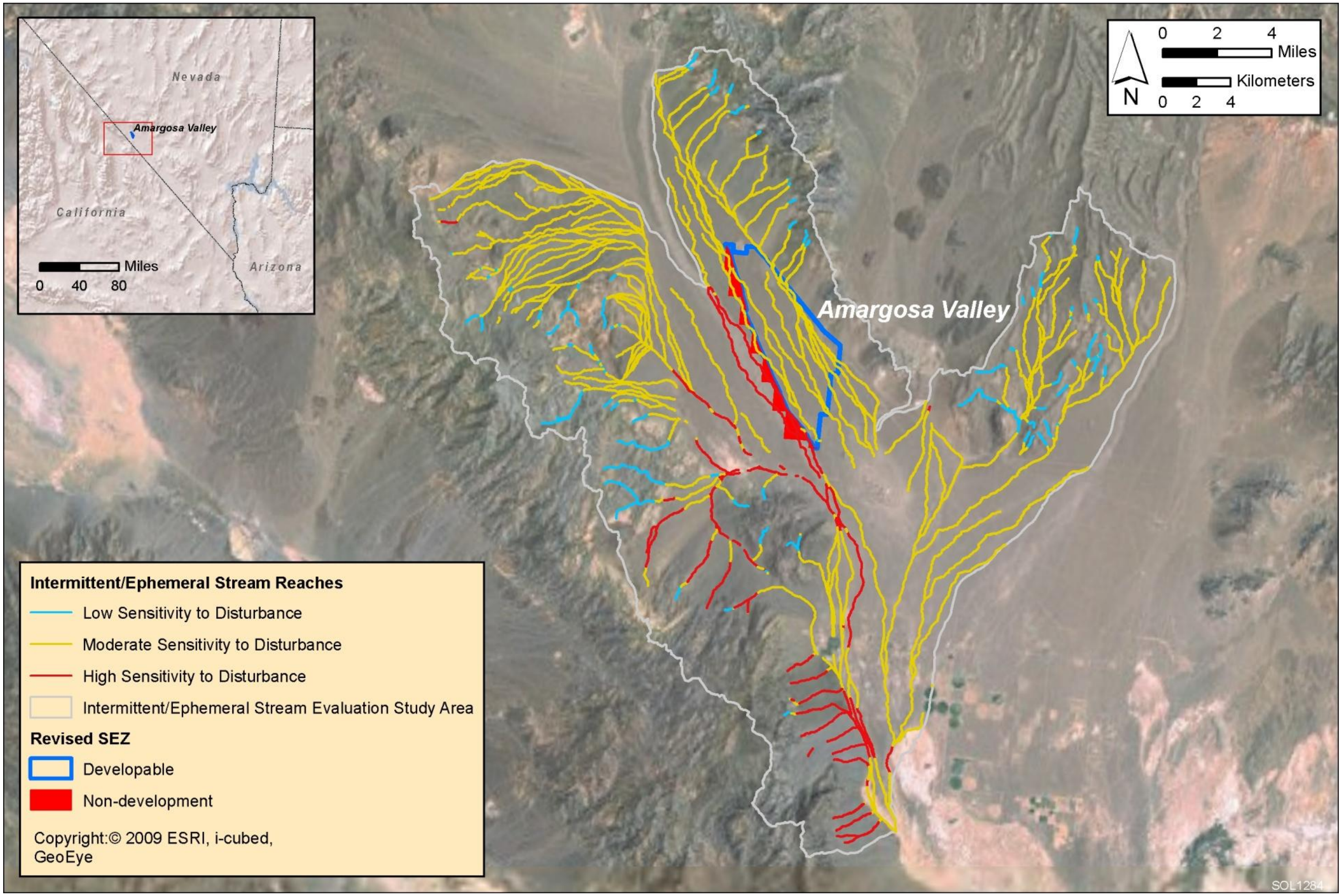


**FIGURE 11.1.9.2-1 Intermittent/Ephemeral Stream Channel Sensitivity to Surface Disturbances in the Vicinity of the Proposed Amargosa Valley SEZ as Revised**

**TABLE 11.1.9.2-1 Estimated Water Requirements for the Proposed Amargosa Valley SEZ as Revised[a]**

| Activity | Parabolic Trough | Power Tower | Dish Engine | PV |
|---|---|---|---|---|
| **Construction—Peak Year** | | | | |
| *Water use requirements* | | | | |
| Fugitive dust control (ac-ft)[b] | 1,056 | 1,584 | 1,584 | 1,584 |
| Potable supply for workforce (ac-ft) | 74 | 45 | 19 | 9 |
| Total water use requirements (ac-ft) | 1,130 | 1,629 | 1,603 | 1,593 |
| *Wastewater generated* | | | | |
| Sanitary wastewater (ac-ft) | 74 | 45 | 19 | 9 |
| **Operations** | | | | |
| *Water use requirements* | | | | |
| Mirror/panel washing (ac-ft/yr) | 678 | 377 | 377 | 38 |
| Potable supply for workforce (ac-ft/yr) | 19 | 8 | 8 | 1 |
| Dry cooling (ac-ft/yr) | 271–1,357 | 151–754 | NA | NA |
| Wet cooling (ac-ft/yr) | 6,105–19,671 | 3,392–10,928 | NA | NA |
| *Total water use requirements* | | | | |
| Non-cooled technologies (ac-ft/yr) | NA[c] | NA | 385 | 39 |
| Dry-cooled technologies (ac-ft/yr) | 968–2,054 | 536–1,139 | NA | NA |
| Wet-cooled technologies (ac-ft/yr) | 6,802–20,368 | 3,777–11,313 | NA | NA |
| *Wastewater generated* | | | | |
| Blowdown (ac-ft/yr) | 385 | 214 | NA | NA |
| Sanitary wastewater (ac-ft/yr) | 19 | 8 | 8 | 1 |

[a] See Section M.9.2 of Appendix M of the Draft Solar PEIS for methods used in estimating water use requirements.

[b] To convert ac-ft to $m^3$, multiply by 1,234.

[c] NA = not applicable.

groundwater model (Table 11.1.9.2-3) represent available literature data and that the model aggregates these value ranges into a simplistic representation of the aquifer.

Depth to groundwater is on the order of 300 ft (91 m) below the surface in the vicinity of the SEZ. The one-dimensional groundwater modeling results suggest that groundwater withdrawals for solar energy development would result in groundwater drawdown in the vicinity of the SEZ (approximately a 2-mi [3.2-km] radius) that ranges up to 23 ft (7 m) for the high pumping scenario, up to 4 ft (1.2 m) for the medium pumping scenario, and less than 1 ft (0.3 m) for the low pumping scenario (Figure 11.1.9.2-2). The majority of the groundwater drawdown occurs within the vicinity of the SEZ with the exception of the high pumping scenario, for which estimates are 4 ft (1.2 m) of drawdown occurring at about 10 mi (16 km) away from the SEZ.

**TABLE 11.1.9.2-2 Groundwater Budget for the Amargosa Desert Groundwater Basin, Which Includes the Proposed Amargosa Valley SEZ as Revised**

| Process | Amount[a] |
|---|---|
| *Inputs* | |
| Amargosa River seepage (ac-ft/yr) | 90[b] |
| Precipitation recharge (ac-ft/yr) | 600–1,200 |
| Underflow from surrounding valleys (ac-ft/yr) | 19,000–44,000 |
| *Outputs* | |
| Evapotranspiration (ac-ft/yr) | 17,000–24,000 |
| Underflow to Death Valley (ac-ft/yr) | 19,000[c] |
| Groundwater withdrawals in 2010 (ac-ft/yr) | 15,393[d] |
| *Storage* | |
| Storage – basin fill aquifer (ac-ft) | 2,300,000 |
| Storage – carbonate rock aquifer (ac-ft) | 3,600,000 |
| Perennial yield (ac-ft/yr) | 24,000[e] |

[a] To convert ac-ft to $m^3$, multiply by 1,234.

[b] Stonestrom et al. (2007).

[c] Ruling 5750 (NDWR 2007).

[d] NDWR pumping inventory for 2010 (NDWR 2010).

[e] Defined by NDWR (2012).

Source: Burbey (1997).

#### *11.1.9.2.3 Off-Site Impacts: Roads and Transmission Lines*

As stated in the Draft Solar PEIS, impacts associated with the construction of roads and transmission lines primarily deal with water use demands for construction, water quality concerns relating to potential chemical spills, and land disturbance effects on the natural hydrology. Water needed for transmission line construction activities (e.g., for soil compaction, dust suppression, and potable supply for workers) could be trucked to the construction area from an off-site source. If this occurred, water use impacts at the SEZ would be negligible. The Draft Solar PEIS assessment of impacts on water resources from road and transmission line construction remains valid.

#### *11.1.9.2.4 Summary of Impacts on Water Resources*

The additional information and analyses of water resources presented in this update agree with information provided in the Draft Solar PEIS. The Amargosa Valley SEZ is located in an

**TABLE 11.1.9.2-3 Aquifer Characteristics and Assumptions Used in the One-Dimensional Groundwater Model for the Proposed Amargosa Valley SEZ as Revised**

| Parameter | Value[a] |
|---|---|
| Aquifer type/conditions | Basin fill/unconfined |
| Aquifer thickness (ft) | 1,400–5,000 (1,500) |
| Hydraulic conductivity (ft/day) | 0.003–427 (36) |
| Transmissivity ($ft^2$/day) | 0.02–64,600 (54,134) |
| Storage coefficient | 0.0004–0.2 (0.03) |
| Analysis period (yr) | 20 |
| High pumping scenario (ac-ft/yr)[b] | 6,802 |
| Medium pumping scenario (ac-ft/yr) | 969 |
| Low pumping scenario (ac-ft/yr) | 39 |

[a] Values used for modeling in parentheses.

[b] To convert ac-ft to $m^3$, multiply by 1,234.

Sources: Belcher et al. (2001); Sweetkind et al. (2001).

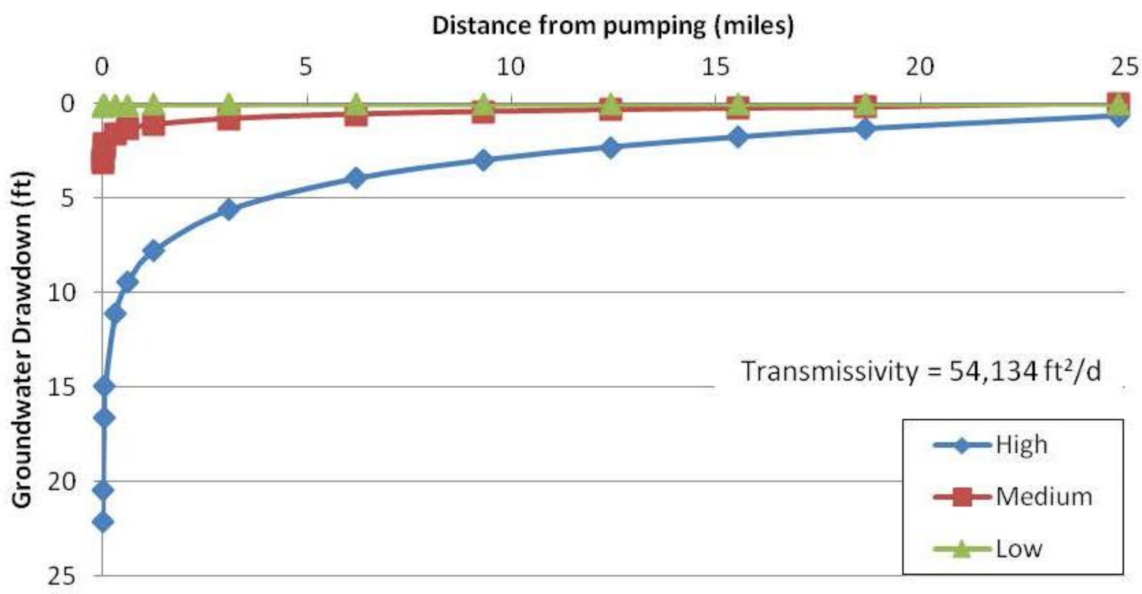


**FIGURE 11.1.9.2-2 Estimated One-Dimensional Groundwater Drawdown Resulting from High, Medium, and Low Groundwater Pumping Scenarios over the 20-Year Operational Period at the Proposed Amargosa Valley SEZ as Revised**

arid desert valley where water resources are primarily groundwater in the basin-fill and regional-scale carbonate rock aquifer, and surface water features are primarily the intermittent Amargosa River and several intermittent/ephemeral streams. Water resources are strictly managed resulting from a U.S. Supreme Court decision in 1976 and subsequently by several management actions by the NDWR in order to protect water resources that support Devils Hole, Ash Meadows NWR, and the Wild and Scenic River reach of the Amargosa River in California (see Section 11.1.9.1.3 in the Draft Solar PEIS).

The intermittent/ephemeral stream evaluation identified several reaches with a moderate sensitivity to disturbance within the SEZ. Disturbances to intermittent/ephemeral stream reaches associated with the stream channels of the Amargosa River could potentially affect the groundwater recharge, flood and sediment conveyance, and ecological habitat value of these reaches (Figure O.1-4 in Appendix O). The reduction of the SEZ boundaries and identification of non-development areas have removed the Amargosa River and its floodplain from the SEZ, thereby reducing potential impacts associated with flooding, debris flows, and groundwater recharge.

Groundwater withdrawals associated with the various groundwater pumping scenarios suggest that the majority of groundwater drawdown will be less than 25 ft (8 m) and localized near the SEZ. The high pumping scenario has the potential for groundwater drawdown impacts more than 10 mi (16 km) away from the SEZ, which potentially affects the Amargosa Farms area of the basin, which has experienced historical groundwater drawdown from agricultural irrigation withdrawals (see Section 11.1.9.1.2 in the Draft Solar PEIS).

Ultimately, water rights and management administered by the NDWR will determine acceptable groundwater withdrawals that can be used to support solar energy development. Given the overallocated condition of the basin, the connectivity of the basin-fill and carbonate rock aquifers, and the sensitivity of groundwater dependency of Devils Hole and Ash Meadows NWR, the NDWR currently limits the transfer of water rights to those that can move groundwater wells farther away from Devils Hole and help alleviate the overallocated conditions of the basin. It is very likely that solar energy developers will have to secure water right allocations that include the retirement of some existing water rights (NDWR 2007, 2008, 2012).

Predicting impacts associated with groundwater withdrawals is often difficult given the heterogeneity of aquifer characteristics, the long time period between the onset of pumping and its effects, and limited data. One of the primary mitigation measures for protecting water resources is the implementation of long-term monitoring and adaptive management. For groundwater, this requires the combination of monitoring and modeling to fully identify the temporal and spatial extent of potential impacts. The BLM is currently working on developing a groundwater modeling framework, which would more accurately predict potential impacts on groundwater and help support long-term monitoring activities. Initial efforts are focused on modifying the Death Valley Regional Flow System Model (http://regmod.wr.usgs.gov/) for use at the Amargosa Valley SEZ. This modeling framework can also be used to interpret groundwater monitoring data and guide adaptive management plans. When the detailed modeling is completed, it will be made available at the project Web site (http://solareis.anl.gov) for use by applicants, the BLM, and other stakeholders.

### 11.1.9.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on surface water and groundwater are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some protection of and reduce impacts on water resources.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature has been identified:

- Groundwater analyses suggest that full build-out of wet-cooled technologies is not feasible; for mixed-technology development scenarios, any proposed wet- and dry-cooled projects should utilize water conservation practices.

The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.1.10 Vegetation

### 11.1.10.1 Affected Environment

Revisions to the boundaries of the Amargosa Valley SEZ have eliminated the Amargosa River and most of the associated floodplain. In addition, the remaining Amargosa River floodplain within the SEZ, consisting of 1,258 acres (5.1 $km^2$), was identified as a non-development area.

As presented in Section 11.1.10.1 of the Draft Solar PEIS, 4 cover types were identified within the area of the proposed Amargosa Valley SEZ, while 18 cover types were identified in the area of indirect effects. Sensitive habitats on the SEZ include desert dry washes, desert chenopod scrub/mixed salt desertscrub, and playas. Because of the changes to the SEZ boundaries, the Sonora-Mojave Mixed Salt Desert Scrub and North American Warm Desert Wash cover types no longer occur within the SEZ, and the North American Arid West Emergent Marsh, North American Warm Desert Pavement, North American Warm Desert Riparian Woodland and Shrubland, Inter-Mountain Basins Shale Badland, and Inter-Mountain Basins Greasewood Flat cover types no longer occur within 5 mi (8 km) of the SEZ boundary. Figure 11.1.10.1-1 shows the cover types within the affected area of the Amargosa Valley SEZ as revised.

### 11.1.10.2 Impacts

As presented in the Draft Solar PEIS, the construction of solar energy facilities within the proposed Amargosa Valley SEZ would result in direct impacts on plant communities because of

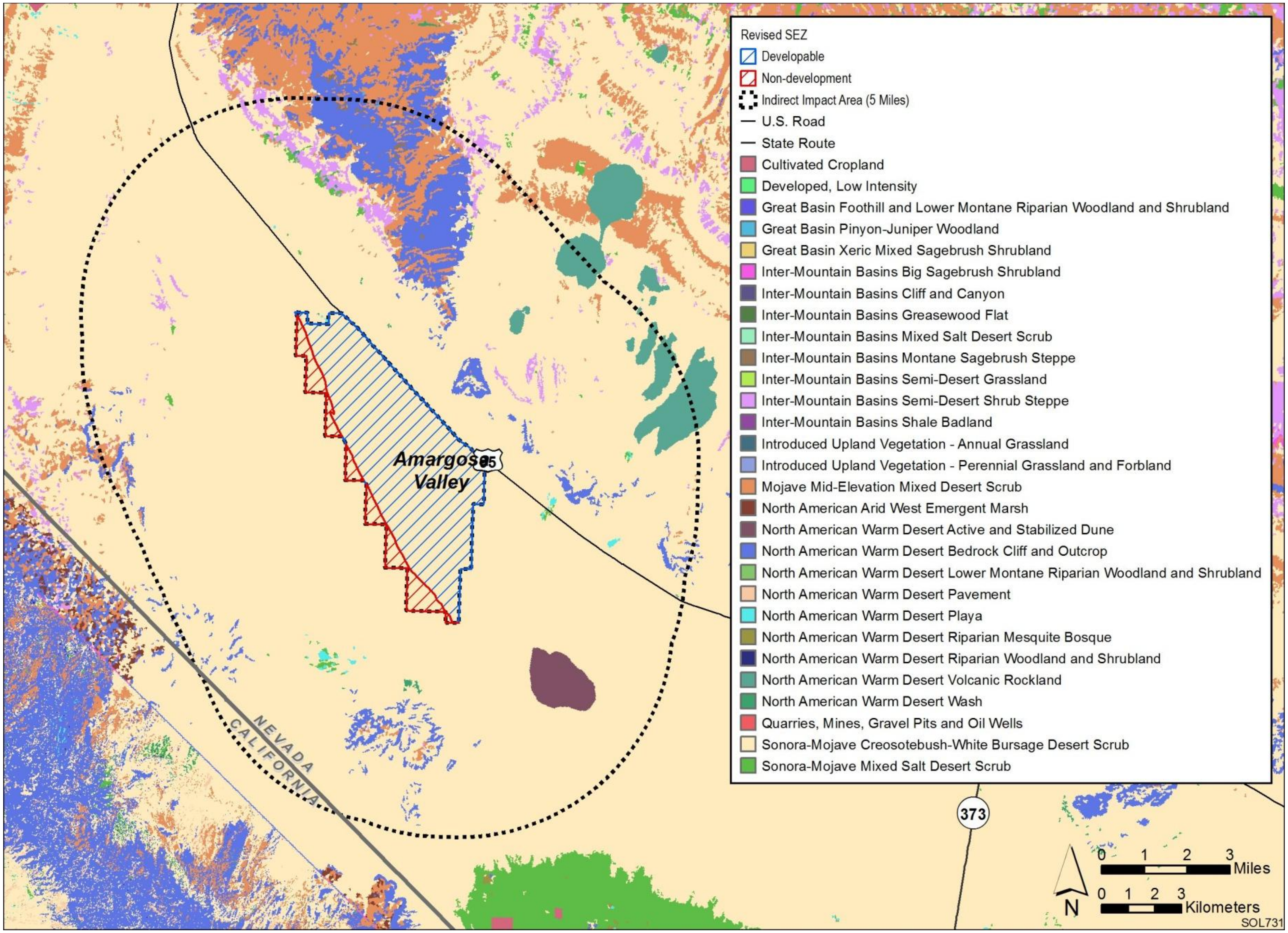


**FIGURE 11.1.10.1-1 Land Cover Types within the Proposed Amargosa Valley SEZ as Revised**

the removal of vegetation within the facility footprint during land-clearing and land-grading operations. Approximately 80% of the SEZ would be expected to be cleared with full development of the SEZ. As a result of the new configuration of the SEZ boundaries, approximately 6,783 acres (27 $km^2$) would be cleared.

Overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the cover type within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of a cover type would be lost; and (3) *large*: >10% of a cover type would be lost.

#### *11.1.10.2.1 Impacts on Native Species*

The analysis presented in the Draft Solar PEIS for the Amargosa Valley SEZ indicated that development would result in a moderate impact on one land cover type and a small impact on all other land cover types occurring within the SEZ (Table 11.1.10.1-1 in the Draft Solar PEIS). Development within the revised Amargosa Valley SEZ could still directly affect some of the cover types evaluated in the Draft Solar PEIS, with the exception of Sonora-Mojave Mixed Salt Desert Scrub and North American Warm Desert Wash; the reduction in the developable area would result in reduced impact levels on all cover types in the affected area. The impact magnitude for Sonora-Mojave Creosotebush-White Bursage Desert Scrub (previously moderate) would be reduced to small, but the impact magnitudes for all other cover types would remain unchanged compared to original estimates in the Draft Solar PEIS. Because of the change in the area of indirect effects, the North American Arid West Emergent Marsh, North American Warm Desert Pavement, North American Warm Desert Riparian Woodland and Shrubland, Inter-Mountain Basins Shale Badland, and Inter-Mountain Basins Greasewood Flat cover types would not be indirectly affected.

Indirect impacts on wetlands, playas, or other intermittently flooded areas downgradient from the SEZ, as described in the Draft Solar PEIS, could still occur. Potential indirect impacts from groundwater use on communities in the region that depend on groundwater, such as mesquite bosque or wetlands at Ash Meadows or those associated with the Amargosa River, could also still occur.

#### *11.1.10.2.2 Impacts from Noxious Weeds and Invasive Plant Species*

As presented in the Draft Solar PEIS, land disturbance from project activities and indirect effects of construction and operation within the Amargosa Valley SEZ could potentially result in the establishment or expansion of noxious weeds and invasive species populations, potentially including those species listed in Section 11.1.10.1 of the Draft Solar PEIS. Impacts such as reduced restoration success and possible widespread habitat degradation could still occur; however, a small reduction in the potential for such impacts would result from the reduced developable area of the SEZ.

#### 11.1.10.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on vegetation are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific species and habitats will determine how programmatic design features are applied, for example:

- All playa and desert dry wash habitats shall be avoided to the extent practicable, and any impacts minimized and mitigated in consultation with appropriate agencies. A buffer area shall be maintained around playas and dry washes to reduce the potential for impacts on these habitats on or near the SEZ.

- Appropriate engineering controls shall be used to minimize impacts on the Amargosa River and on dry wash, playa, riparian, and wetland habitats, including downstream occurrences, resulting from surface water runoff, erosion, sedimentation, altered hydrology, accidental spills, or fugitive dust deposition to these habitats. Appropriate buffers and engineering controls will be determined through agency consultation. Appropriate measures to minimize impacts on Big Dunes habitats should be determined through agency consultation.

- Groundwater withdrawals shall be limited to reduce the potential for indirect impacts on groundwater-dependent habitats in the Amargosa Desert groundwater basin or in other hydraulically connected basins, such as springs at Ash Meadows and Death Valley NP, other locations of groundwater discharge, such as the Amargosa River, or other groundwater-dependent habitats in the vicinity of the SEZ, such as mesquite bosque communities.

It is anticipated that implementation of these programmatic design features will reduce a high potential for impacts from invasive species and potential impacts on dry washes, playas, chenopod scrub, mesquite bosque, springs, riparian habitats, wetlands, and dune habitats to a minimal potential for impact. Residual impacts on wetlands could result from remaining groundwater withdrawal and so forth; however, it is anticipated that these impacts would be avoided in the majority of instances.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for vegetation have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.1.11 Wildlife and Aquatic Biota

For the assessment of potential impacts on wildlife and aquatic biota, overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the species' habitat within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of the species' habitat would be lost; and (3) *large*: >10% of the species' habitat would be lost.

#### 11.1.11.1 Amphibians and Reptiles

##### *11.1.11.1.1 Affected Environment*

As presented in Section 11.1.11.1 of the Draft Solar PEIS, representative amphibian and reptile species expected to occur within the Amargosa Valley SEZ include the red-spotted toad (*Bufo punctatus*), desert horned lizard (*Phrynosoma platyrhinos*), Great Basin collared lizard (*Crotaphytus bicinctores*), long-nosed leopard lizard (*Gambelia wislizenii*), side-blotched lizard (*Uta stansburiana*), western fence lizard (*Sceloporus occidentalis*), western whiptail (*Cnemidophorus tigris*), zebra-tailed lizard (*Callisaurus draconoides*), coachwhip (*Masticophis flagellum*), glossy snake (*Arizona elegans*), gophersnake (*Pituophis catenifer*), groundsnake (*Sonora semiannulata*), nightsnake (*Hypsiglena torquata*), and sidewinder (*Crotalus cerastes*). The reduction in the size of the Amargosa Valley SEZ does not alter the potential for these species to occur in the affected area.

##### *11.1.11.1.2 Impacts*

As presented in the Draft Solar PEIS, solar energy development within the Amargosa Valley SEZ could affect potentially suitable habitats for the representative amphibian and reptile species. The analysis presented in the Draft Solar PEIS for the Amargosa Valley SEZ indicated that development would result in a small overall impact on most representative amphibian and reptile species and a moderate impact on the glossy snake and sidewinder (Table 11.1.11.1-1 in the Draft Solar PEIS). The reduction in the developable area of the Amargosa Valley SEZ would result in reduced habitat impacts for all representative amphibian and reptile species; the resultant impact levels for all the representative species would be small.

##### *11.1.11.1.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features are described in Section A.2.2 of Appendix A of this Final Solar PEIS. With the implementation of required programmatic design features, impacts on amphibian and reptile species will be reduced.

Because of the change in boundaries of the SEZ, the SEZ-specific design feature identified in Section 11.1.11.2.3 of the Draft Solar PEIS (i.e., the Amargosa River should be avoided) is no longer applicable. On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for amphibian and reptile species have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.1.11.2 Birds

#### *11.1.11.2.1 Affected Environment*

As presented in Section 11.1.11.2.1 of the Draft Solar PEIS, a large number of bird species could occur or have potentially suitable habitat within the affected area of the proposed Amargosa Valley SEZ. Representative bird species identified in the Draft Solar PEIS included (1) shorebirds: killdeer (*Charadrius vociferus*); (2) passerines: ash-throated flycatcher (*Myiarchus cinerascens*), Bewick's wren (*Thryomanes bewickii*), black-tailed gnatcatcher (*Polioptila melanura*), black-throated sparrow (*Amphispiza bilineata*), common poorwill (*Phalaenoptilus nuttallii*), common raven (*Corvus corax*), Costa's hummingbird (*Calypte costae*), greater roadrunner (*Geococcyx californianus*), horned lark (*Eremophila alpestris*), ladder-backed woodpecker (*Picoides scalaris*), Le Conte's thrasher (*Toxostoma lecontei*), lesser nighthawk (*Chordeiles acutipennis*), loggerhead shrike (*Lanius ludovicianus*), northern mockingbird (*Mimus polyglottos*), rock wren (*Salpinctes obsoletus*), sage sparrow (*Amphispiza belli*), Say's phoebe (*Sayornis saya*), verdin (*Auriparus flaviceps*), and western kingbird (*Tyrannus verticalis*); (3) raptors: American kestrel (*Falco sparverius*), golden eagle (*Aquila chrysaetos*), great horned owl (*Bubo virginianus*), long-eared owl (*Asio otus*), red-tailed hawk (*Buteo jamaicensis*), and turkey vulture (*Cathartes aura*); and (4) upland gamebirds: chukar (*Alectoris chukar*), Gambel's quail (*Callipepla gambelii*), mourning dove (*Zenaida macroura*), and white-winged dove (*Zenaida asiatica*). The reduction in the size of the Amargosa Valley SEZ does not alter the potential for these species or other bird species to occur in the affected area.

#### *11.1.11.2.2 Impacts*

As presented in the Draft Solar PEIS, solar energy development within the Amargosa Valley SEZ could affect potentially suitable bird habitats. The analysis presented in the Draft Solar PES for the Amargosa Valley SEZ indicated that development would result in a small overall impact on most representative bird species and a moderate impact on the black-tailed gnatcatcher (Table 11.1.11.2-1 in the Draft Solar PEIS). The reduction in the developable area of the Amargosa Valley SEZ would result in reduced habitat impacts for all representative bird species; the resultant impact levels for all the representative bird species would be small.

#### *11.1.11.2.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on bird species are described in Section A.2.2 of Appendix A of this Final Solar PEIS. With the implementation of required programmatic design features and the applicable SEZ-specific design features, impacts on bird species are anticipated to be small.

Because of the change in boundaries of the SEZ, one of the SEZ-specific design features identified in Section 11.1.11.2.3 of the Draft Solar PEIS (i.e., the Amargosa River should be avoided) is no longer applicable. On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for bird species have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.1.11.3 Mammals

#### *11.1.11.3.1 Affected Environment*

As presented in Section 11.1.11.3.1 of the Draft Solar PEIS, a large number of mammal species were identified that could occur or have potentially suitable habitat within the affected area of the proposed Amargosa Valley SEZ. Representative mammal species identified in the Draft Solar PEIS included (1) big game species: cougar (*Puma concolor*), elk (*Cervis canadensis*), mule deer (*Odocoileus hemionus*), and pronghorn (*Antilocapra americana*); (2) furbearers and small game species: the American badger (*Taxidea taxus*), black-tailed jackrabbit (*Lepus californicus*), bobcat (*Lynx rufus*), coyote (*Canis latrans*, common), desert cottontail (*Sylvilagus audubonii*), gray fox (*Urocyon cinereoargenteus*), kit fox (*Vulpes macrotis*), and red fox (*Vulpes vulpes*); and (3) small nongame species: Botta's pocket gopher (*Thomomys bottae*), cactus mouse (*Peromyscus eremicus*), canyon mouse (*P. crinitis*), deer mouse (*P. maniculatus*), desert kangaroo rat (*Dipodomys deserti*), desert shrew (*Notiosorex crawfordi*), desert woodrat (*Neotoma lepida*), little pocket mouse (*Perognathus longimembris*), long-tailed pocket mouse (*Chaetodipus formosus*), Merriam's pocket mouse (*Dipodomys merriami*), northern grasshopper mouse (*Onychomys leucogaster*), southern grasshopper mouse (*O. torridus*), western harvest mouse (*Reithrodontomys megalotis*), and white-tailed antelope squirrel (*Ammospermophilus leucurus*). Bat species that may occur within the area of the SEZ include the big brown bat (*Eptesicus fuscus*), Brazilian free-tailed bat (*Tadarida brasiliensis*), California myotis (*Myotis californicus*), hoary bat (*Lasiurus cinereus*), little brown myotis (*M. lucifugus*), long-legged myotis (*M. volans*), silver-haired bat (*Lasionycteris noctivagans*), and western pipistrelle (*Parastrellus hesperus*). The reduction in the size of the Amargosa Valley SEZ does not alter the potential for these species or any additional mammal species to occur in the affected area.

#### *11.1.11.3.2 Impacts*

As presented in the Draft Solar PEIS, solar energy development within the Amargosa Valley SEZ could affect potentially suitable habitats of mammal species. The analysis presented in the Draft Solar PEIS for the Amargosa Valley SEZ indicated that development would result in a small overall impact on most representative mammal species analyzed and a moderate impact on the Botta's pocket gopher and the western harvest mouse (Table 11.1.11.3-1 in the Draft Solar PEIS). The reduction in the developable area of the Amargosa Valley SEZ would result in reduced habitat impacts for all representative mammal species; resultant impact levels for all the representative mammal species would be small. On the basis of mapped activity areas, direct potential loss of overall range for the cougar would be reduced from 25,300 acres (102 $km^2$) to 6,783 acres (27.4 $km^2$). No mapped activity areas for elk, mule deer, or pronghorn occur within the original configuration or reconfiguration of the SEZ. Direct impact levels for big game activity areas would still be small to none.

#### *11.1.11.3.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on mammal species are described in Section A.2.2 of Appendix A of this Final Solar PEIS. With the implementation of required programmatic design features, impacts on mammal species will be reduced.

Because of the change in boundaries of the SEZ, one of the SEZ-specific design features identified in Section 11.1.11.3.3 of the Draft Solar PEIS (i.e., the Amargosa River should be avoided) is no longer applicable. On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features have been identified through this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.1.11.4 Aquatic Biota

#### *11.1.11.4.1 Affected Environment*

There are no surface water bodies, wetlands, or perennial streams within the proposed Amargosa Valley SEZ. The boundaries of the Amargosa Valley SEZ have been reduced compared to the boundaries given in the Draft Solar PEIS. On the basis of these changes, updates to the Draft Solar PEIS include the following:

- The intermittent/ephemeral Amargosa River has been identified as a non-development area.

- There are no surface water bodies, wetlands, or perennial streams located within the area of indirect effects within 5 mi (8 km) of the SEZ. However, 13 mi (21 km) of the Amargosa River and 15 mi (24 km) of an unnamed intermittent stream that drains into the Amargosa River are present in the area of indirect effects.

- Outside of the potential indirect effects area but within 50 mi (80 km) of the SEZ, there are 534 mi (859 km) of intermittent stream located within 50 mi (80 km) of the SEZ and 16 mi (26 km) of an unnamed perennial stream.

- The proposed new road corridor has been moved and is more than 10 mi (16 km) from the perennial White River.

There is no information on aquatic biota in the surface water features in the SEZ. As stated in Appendix C of the Supplement to the Draft Solar PEIS, site surveys can be conducted at the project-specific level to characterize aquatic biota, if present.

#### *11.1.11.4.2 Impacts*

The types of impacts from the development of utility-scale solar energy facilities that could affect aquatic habitats and biota are discussed in Section 5.10.3 of the Draft Solar PEIS and this Final Solar PEIS. Aquatic habitats could be affected by solar energy development in a number of ways, including (1) direct disturbance, (2) deposition of sediments, (3) changes in water quantity, and (4) degradation of water quality. The impact assessment provided in the Draft Solar PEIS remains valid with the following update:

- The intermittent/ephemeral Amargosa River has been identified as a non-development area; therefore, streams and wetlands would not be directly affected by construction activities. However, as described in the Draft Solar PEIS, streams and wetlands could be affected indirectly by solar development activities within the SEZ.

#### *11.1.11.4.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on aquatic biota are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific resources and conditions will determine how programmatic design features are applied, for example:

- Appropriate engineering controls shall be implemented to minimize the amount of sediment and contaminants entering the Amargosa River.

- Development shall avoid any additional wetlands identified during future site-specific fieldwork.

- If groundwater is used, the amount withdrawn shall not affect aquatic habitat in the Amargosa River ACEC and the Ash Meadows NWR.

It is anticipated that implementation of the programmatic design features will reduce impacts on aquatic biota, and if the utilization of water from groundwater or surface water sources is adequately controlled to maintain sufficient water levels in nearby aquatic habitats, the potential impacts on aquatic biota from solar energy development at the Amargosa Valley SEZ would be small.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for aquatic biota have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.1.12 Special Status Species

### 11.1.12.1 Affected Environment

As presented in the Draft Solar PEIS, 52 special status species were identified that could occur or have potentially suitable habitat within the affected area of the proposed Amargosa Valley SEZ. The reduction in the size of the Amargosa Valley SEZ does not alter the potential for these species to occur in the affected area, but it may reduce the impact magnitude for some species with moderate or large impacts as determined in the Draft Solar PEIS. A total of seven special status species that were determined to have moderate or large impacts in the Draft Solar PEIS are re-evaluated here. These species include (1) plants: Ash Meadows buckwheat (*Eriogonum contiguum*), Death Valley beardtongue (*Penstemon fruticiformis ssp. amargosae*), Panamint Mountains bedstraw (*Galium hilendiae ssp. carneum*), weasel phacelia (*Phacelia mustelina*), and white-margined beardtongue (*Penstemon albomarginatus*); (2) reptiles: desert tortoise (*Gopherus agassizii*); and (3) birds: prairie falcon (*Falco mexicanus*).

Since publication of the Draft Solar PEIS, 14 additional special status species have been identified that could potentially occur in the affected area based on county-level occurrences and the presence of potentially suitable habitat. These 14 special status species are all designated sensitive species by the Nevada BLM office and include (1) birds: crissal thrasher (*Toxostoma crissale*), golden eagle (*Aquila chrysaetos*), gray vireo (*Vireo vicinior*), Le Conte's thrasher (*Toxostoma lecontei*), loggerhead shrike (*Lanius ludovicianus*), long-eared owl (*Asio otus*), and Lucy's warbler (*Vermivora luciae*); and (2) mammals: big brown bat (*Eptesicus fuscus*), Brazilian free-tailed bat (*Tadarida brasiliensis*), California myotis (*Myotis californicus*), hoary bat (*Lasiurus cinereus*), long-legged myotis (*Myotis volans*), silver-haired bat (*Lasionycteris noctivagans*), and western pipistrelle (*Pipistrellus Hesperus*). These additional species are discussed below, along with a re-evaluation of those species determined to have moderate or large impacts in the Draft Solar PEIS. Figure 11.1.12.1-1 shows the known or potential occurrences of species in the affected area of the Amargosa Valley SEZ that are listed, proposed, or candidates for listing under the ESA.

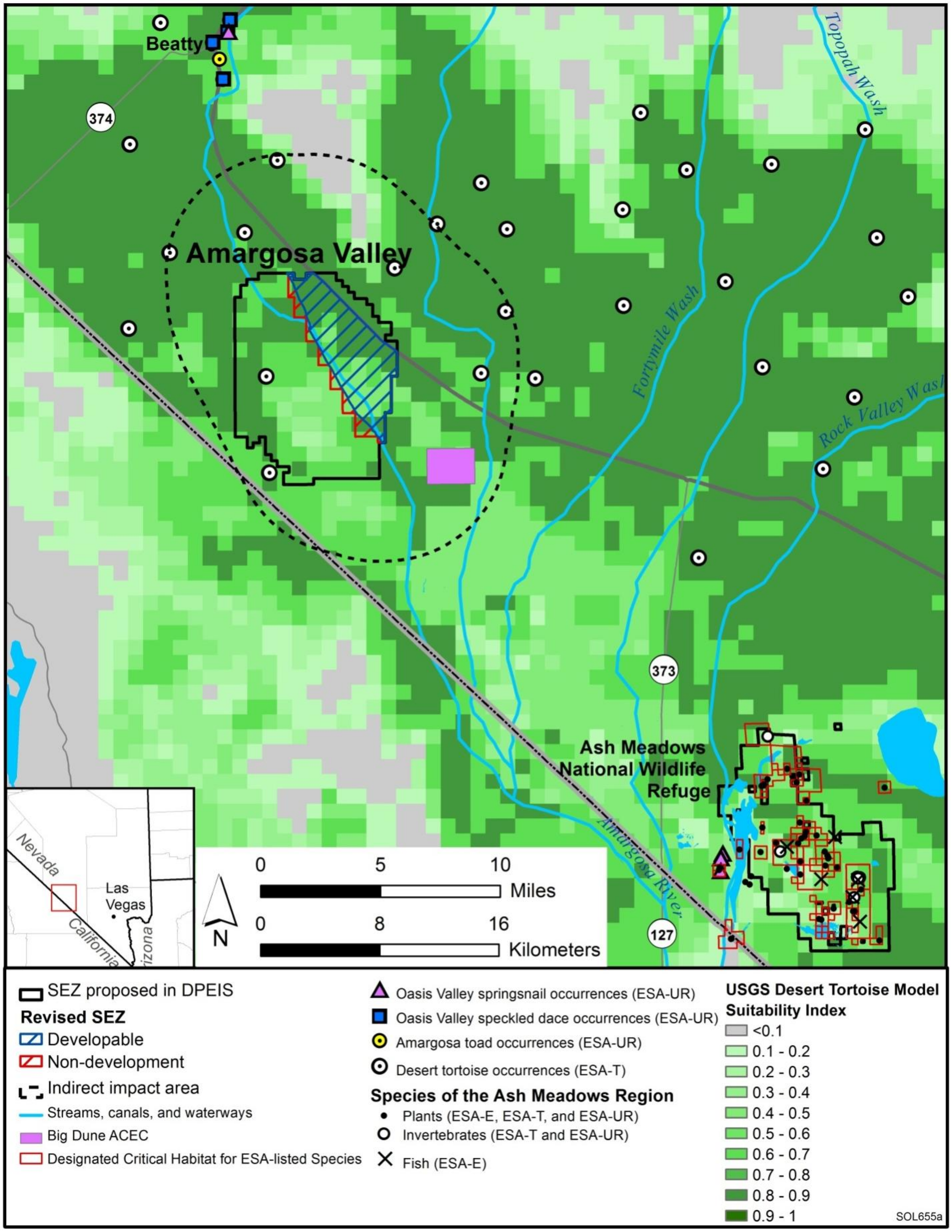


**FIGURE 11.1.12.1-1 Proposed Amargosa Valley SEZ as Revised and Distribution of Potentially Suitable Habitat for Species Listed under the Endangered Species Act**

#### *11.1.12.1.1 Species Listed under the Endangered Species Act That Could Occur in the Affected Area*

The desert tortoise is listed as threatened under the ESA and is known to occur throughout the SEZ affected area. This species was evaluated in the Draft Solar PEIS. According to the SWReGAP habitat suitability model, approximately 8,470 acres (34 km$^2$) of potentially suitable habitat for the desert tortoise intersects the area of direct effects in the Amargosa Valley SEZ (Figure 11.1.12.1-1; Table 11.1.12.1-1). Approximately 91,900 acres (372 km$^2$) of potentially suitable habitat occurs outside the SEZ within the area of indirect effects. Designated critical habitat does not occur in the affected area. Additional information provided by the USFWS since the publication of the Draft Solar PEIS indicates that the revised Amargosa Valley SEZ is situated in an area that provides habitat and genetic connectivity between areas with greater habitat suitability (Figure 11.1.12.1-1) (Ashe 2012). The USFWS determined the desert tortoise connectivity areas on the basis of the USGS model for desert tortoise predicted suitable habitat (Nussear et al. 2009).

#### *11.1.12.1.2 BLM-Designated Sensitive Species*

There are 18 BLM-designated sensitive species that are discussed in this Final Solar PEIS. Of these species, three were analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. These species were determined to have large or moderate impacts resulting from solar energy development within the SEZ and are thus re-evaluated in this Final Solar PEIS. These species include (1) plants: Death Valley beardtongue and white-margined beardtongue; and (2) birds: prairie falcon. The remaining 15 species were not evaluated for the Amargosa Valley SEZ in the Draft Solar PEIS and are discussed in this Final Solar PEIS because of their potential to occur in the SEZ affected area. These species include (1) birds: crissal thrasher, golden eagle, gray vireo, Le Conte’s thrasher, loggerhead shrike, long-eared owl, and Lucy’s warbler; and (2) mammals: big brown bat, Brazilian free-tailed bat, California myotis, hoary bat, long-legged myotis, silver-haired bat, and western pipistrelle.

**Death Valley Beardtongue**

The Death Valley beardtongue is a perennial shrub that is known only from the Death Valley region of California and southern Nevada. This species was analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. It inhabits Mojave desertscrub communities at elevations between 2,800 and 4,600 ft (850 and 1,400 m). The nearest known occurrences are 13 mi (21 km) east of the proposed Amargosa Valley SEZ. Potentially suitable habitat for the species occurs on the SEZ and other portions of the affected area (Table 11.1.12.1-1).

**White-Margined Beardtongue**

The white-margined beardtongue is a perennial forb that occurs in the deserts of Arizona, California, and Nevada. This species was analyzed for the Amargosa Valley SEZ in the Draft

**TABLE 11.1.12.1-1 Habitats, Potential Impacts, and Potential Mitigation for Special Status Species That Could Be Affected by Solar Energy Development on the Proposed Amargosa Valley SEZ as Revised[a]**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Maximum Area of Potential Habitat Affected[d]: Outside SEZ (Indirect Effects )[f] | Overall Impact Magnitude[g] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Plants*** | | | | | | |
| **Ash Meadows buckwheat[i]** | ***Eriogonum contiguum*** | NV-S1 | Known from the Mojave Desert of Inyo County, California, and Clark and Nye Counties, Nevada. Occurs on sandy to gravelly flats and slopes in association with creosote scrub and mesquite communities at elevations below 3,280 ft.[j] Occurs in the area of indirect effects. Nearest recorded occurrence is from the Funeral Mountains, approximately 4 mi[k] southwest of the SEZ. About 1,771,500[l] acres of potentially suitable habitat occurs within the SEZ region. | 6,780 acres of potentially suitable habitat lost (0.4% of available potentially suitable habitat) | 95,000 acres of potentially suitable habitat (5.4% of available potentially suitable habitat) | Small overall impact. Pre-disturbance surveys, avoidance or minimization of disturbance to occupied habitats in the areas of direct effects, translocation of individuals from areas of direct effects, or compensatory mitigation of direct effects on occupied habitats could reduce impacts. |
| Death Valley beardtongue | *Penstemon fruticiformis* ssp. *amargosae* | BLM-S; FWS-SC; NV-S2 | Known only from the Death Valley region of California and southern Nevada. It inhabits Mojave desertscrub communities at elevations between 2,800 and 4,600 ft. Nearest recorded occurrence is approximately 13 mi east of the SEZ. About 2,424,000 acres of potentially suitable habitat occurs within the SEZ region. | 6,780 acres of potentially suitable habitat lost (0.3% of available potentially suitable habitat) | 95,000 acres of potentially suitable habitat (3.9% of available potentially suitable habitat) | Small overall impact. See Ash Meadows buckwheat for a list of other potential mitigation measures. |

**TABLE 11.1.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Maximum Area of Potential Habitat Affected[d]: Outside SEZ (Indirect Effects )[f] | Overall Impact Magnitude[g] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Plants (Cont.)*** | | | | | | |
| Panamint Mountains bedstraw | *Galium hilendiae* ssp. *carneum* | NV-S1 | Endemic to the Mojave Desert region of Inyo County, California, and Nye County, Nevada. Inhabits creosote scrub and pinyon-juniper woodland communities. Nearest recorded occurrence is from the Death Valley NP, approximately 22 mi northwest of the SEZ. About 1,742,100 acres of potentially suitable habitat occurs within the SEZ region. | 6,780 acres of potentially suitable habitat lost (0.4% of available potentially suitable habitat) | 92,150 acres of potentially suitable habitat (5.3% of available potentially suitable habitat) | Small overall impact. See Ash Meadows buckwheat for a list of other potential mitigation measures. |
| Weasel phacelia | *Phacelia mustelina* | NV-S2 | Mojave desertscrub, pinyon-juniper woodlands on volcanic or gravelly substrates at elevations between 5,000 and 5,500 ft. Nearest recorded occurrence is from the Death Valley NP, approximately 18 mi northwest of the SEZ. About 2,766,600 acres of potentially suitable habitat occurs within the SEZ region. | 6,780 acres of potentially suitable habitat lost (0.2% of available potentially suitable habitat) | 96,850 acres of potentially suitable habitat (3.5% of available potentially suitable habitat) | Small overall impact. See Ash Meadows buckwheat for a list of other potential mitigation measures. |
| White-margined beardtongue | *Penstemon albomarginatus* | BLM-S; FWS-SC; NV-S2 | Inhabits desert sand dune habitats and Mojavean desertscrub communities at elevations below 3,600 ft. Nearest recorded occurrence is approximately 17 mi east of the SEZ. About 2,464,200 acres of potentially suitable habitat occurs within the SEZ region. | 6,780 acres of potentially suitable habitat lost (0.3% of available potentially suitable habitat) | 96,150 acres of potentially suitable habitat (3.9% of available potentially suitable habitat) | Small overall impact. See Ash Meadows buckwheat for a list of other potential mitigations measures. |

**TABLE 11.1.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Maximum Area of Potential Habitat Affected[d]: Outside SEZ (Indirect Effects )[f] | Overall Impact Magnitude[g] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Reptiles*** | | | | | | |
| **Desert tortoise** | ***Gopherus agassizii*** | ESA-T; NV-P; NV-S2 | Mojave and Sonoran desert creosotebush communities on firm soils for digging burrows. Often found along riverbanks, washes, canyon bottoms, creosote flats, and desert oases. Known to occur on the SEZ. About 2,717,800 acres of potentially suitable habitat occurs within the SEZ region. | 8,470 acres of potentially suitable habitat lost (0.3% of available potentially suitable habitat) | 92,000 acres of potentially suitable habitat (3.4% of available potentially suitable habitat) | Small overall impact. Pre-disturbance surveys, avoidance or minimization of disturbance to occupied habitats on the SEZ, translocation of individuals from areas of direct effects, or compensatory mitigation of direct effects on occupied habitats could reduce impacts. The potential for impact and need for mitigation should be determined in consultation with the USFWS and NDOW. |
| ***Birds*** | | | | | | |
| Crissal thrasher | *Toxostoma crissale* | BLM-S | A local and uncommon resident in southern Nevada outside of the Colorado River Valley. Occupies dense thickets of shrubs or low trees in riparian habitats. About 4,000 acres of potentially suitable habitat occurs within the SEZ region. | 0 acres | 85 acres of potentially suitable habitat (2.1% of available potentially suitable habitat) | Small overall impact; no direct effects. No species-specific mitigation is warranted. |
| Golden eagle | *Aquila chrysaetos* | BLM-S | An uncommon to common permanent resident and migrant in southern Nevada. Habitat includes rolling foothills, mountain areas, and desert shrublands. Nests on cliff faces and in large trees in open areas. About 2,800,000 acres of potentially suitable habitat occurs within the SEZ region. | 8,470 acres of potentially suitable habitat lost (0.3% of available potentially suitable habitat) | 110,000 acres of potentially suitable habitat (3.9% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |

TABLE 11.1.12.1-1 (Cont.)

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Maximum Area of Potential Habitat Affected[d]: Outside SEZ (Indirect Effects )[f] | Overall Impact Magnitude[g] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Birds (Cont.)*** | | | | | | |
| Gray vireo | *Vireo vicinior* | BLM-S | An uncommon summer resident in arid environments such as pinyon-juniper, chaparral, and desert shrublands. Builds open-cup nests of plant material in forked branches of shrubs or small trees. About 3,600,000 acres of potentially suitable habitat occurs within the SEZ region. | 0 acres | 6,200 acres of potentially suitable habitat (1.7% of available potentially suitable habitat) | Small overall impact; no direct effects. No species-specific mitigation is warranted. |
| Le Conte's thrasher | *Toxostoma lecontei* | BLM-S | An uncommon to rare local resident in southwestern deserts. Occurs primarily in open desert wash, desertscrub, alkali desertscrub, and desert succulent scrub habitats. Nests in dense, spiny shrubs or densely branched cactus in desert wash habitat. About 1,500,000 acres of potentially suitable habitat occurs within the SEZ region. | 8,470 acres of potentially suitable habitat lost (0.6% of available potentially suitable habitat) | 101,350 acres of potentially suitable habitat (6.8% of available potentially suitable habitat) | Small overall impact on foraging and nesting habitat. Pre-disturbance surveys, avoidance or minimization of disturbance to occupied habitats in the areas of direct effects (particularly within desert wash habitats); or compensatory mitigation of direct effects on occupied habitats could reduce impacts. |
| Loggerhead shrike | *Lanius ludovicianus* | BLM-S | A common winter resident in lowlands and foothills in southern Nevada. Prefers open habitats with shrubs, trees, utility lines, or other perches. Highest density occurs in open-canopied foothill forests. About 2,270,000 acres of potentially suitable habitat occurs within the SEZ region. | 0 acres | 22,900 acres of potentially suitable habitat (1.0% of available potentially suitable habitat) | Small overall impact; no direct effects. No species-specific mitigation is warranted. |

**TABLE 11.1.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Outside SEZ (Indirect Effects )[f] | Overall Impact Magnitude[g] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Birds (Cont.)*** | | | | | | |
| Long-eared owl | *Asio otus* | BLM-S | An uncommon yearlong resident in southern Nevada. Occurs in desert shrubland environments in proximity to riparian areas such as desert washes. Nests in trees using old nests from other birds or squirrels. About 2,500,000 acres of potentially suitable habitat occurs within the SEZ region. | 8,470 acres of potentially suitable habitat lost (0.3% of available potentially suitable habitat) | 101,500 acres of potentially suitable habitat (4.1% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| Lucy's warbler | *Vermivora luciae* | BLM-S | An uncommon summer resident and breeder in desert riparian areas. Occurs in desert wash habitats, especially those dominated by mesquite and saltcedar. Nests in tiny cavities in riparian woodlands. About 4,500 acres of potentially suitable habitat occurs within the SEZ region. | 0 acres | 85 acres of potentially suitable habitat (1.9% of available potentially suitable habitat) | Small overall impact; no direct effects. No species-specific mitigation is warranted. |
| Prairie falcon | *Falco mexicanus* | BLM-S | Year-round resident in the SEZ region, primarily in open habitats in mountainous areas, steppe, grasslands, or cultivated areas. Typically nests in well-sheltered ledges of rocky cliffs and outcrops. About 2,338,500 acres of potentially suitable habitat occurs within the SEZ region. | 8,470 acres of potentially suitable habitat lost (0.4% of available potentially suitable habitat) | 105,000 acres of potentially suitable habitat (4.5% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |

**TABLE 11.1.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Maximum Area of Potential Habitat Affected[d]: Outside SEZ (Indirect Effects )[f] | Overall Impact Magnitude[g] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Mammals*** | | | | | | |
| Big brown bat | *Eptesicus fuscus* | BLM-S | Occurs throughout the southwestern United States in various habitat types. Uncommon in hot desert environments but may occur in areas in close proximity to water sources such as lakes and washes. Roosts in buildings, caves, mines, and trees. About 1,500,000 acres of potentially suitable habitat occurs within the SEZ region. | 8,470 acres of potentially suitable habitat lost (0.6% of available potentially suitable habitat) | 105,000 acres of potentially suitable habitat (7.0% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| Brazilian free-tailed bat | *Tadarida brasiliensis* | BLM-S | A fairly common year-round resident in southern Nevada. Occurs in a variety of habitats, including woodlands, shrublands, and grasslands. Roosts in caves, crevices, and buildings. About 1,800,000 acres of potentially suitable habitat occurs within the SEZ region. | 8,470 acres of potentially suitable habitat lost (0.5% of available potentially suitable habitat) | 106,000 acres of potentially suitable habitat (5.9% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| California myotis | *Myotis californicus* | BLM-S | A common year-round resident in southern Nevada. Occurs in a variety of habitats, including desert, chaparral, woodlands, and forests. Roosts primarily in crevices, but will also use buildings, mines, and hollow trees. About 2,000,000 acres of potentially suitable habitat occurs within the SEZ region. | 8,470 acres of potentially suitable habitat lost (0.4% of available potentially suitable habitat) | 105,000 acres of potentially suitable habitat (5.3% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |

**TABLE 11.1.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Outside SEZ (Indirect Effects )[f] | Overall Impact Magnitude[g] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Mammals (Cont.)*** | | | | | | |
| Hoary bat | *Lasiurus cinereus* | BLM-S | The most widespread North American bat species, occurs throughout southern Nevada in various habitat types. Occurs in habitats such as woodlands, foothills, desert shrublands, and chaparral. Roosts primarily in trees. About 1,800,000 acres of potentially suitable habitat occurs within the SEZ region. | 8,470 acres of potentially suitable habitat lost (0.5% of available potentially suitable habitat) | 105,000 acres of potentially suitable habitat (5.8% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| Long-legged myotis | *Myotis volans* | BLM-S | Common to uncommon year-round resident in southern Nevada. Uncommon in desert and arid grassland environments. Most common in woodlands above 4,000 ft elevation. Forages in chaparral, scrub, woodlands, and desert shrublands. Roosts in trees, caves, and crevices. About 1,800,000 acres of potentially suitable habitat occurs within the SEZ region. | 8,470 acres of potentially suitable habitat lost (0.5% of available potentially suitable habitat) | 105,000 acres of potentially suitable habitat (5.8% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |

**TABLE 11.1.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Maximum Area of Potential Habitat Affected[d]: Outside SEZ (Indirect Effects)[f] | Overall Impact Magnitude[g] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Mammals (Cont.)*** | | | | | | |
| Silver-haired bat | *Lasionycteris noctivagans* | BLM-S | Uncommon year-round resident in desert habitats of southern Nevada. Forages in coniferous forests, foothill woodlands, and montane riparian habitats. May also forage in desert shrublands. Primarily roosts in hollow trees. About 1,400,000 acres of potentially suitable habitat occurs within the SEZ region. | 8,470 acres of potentially suitable habitat lost (0.6% of available potentially suitable habitat) | 105,000 acres of potentially suitable habitat (7.5% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| Western pipistrelle | *Pipistrellus Hesperus* | BLM-S | A common year-round resident of deserts, grasslands, and woodlands in southern Nevada. Occurs in various habitats, including mountain foothill woodlands, desert shrublands, desert washes, and pinyon-juniper woodlands. Roosts primarily in rock crevices; occasionally in mines and caves. About 2,500,000 acres of potentially suitable habitat occurs within the SEZ region. | 8,470 acres of potentially suitable habitat lost (0.3% of available potentially suitable habitat) | 105,000 acres of potentially suitable habitat (4.3% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |

[a] The species presented in this table represent new species identified following publication of the Draft Solar PEIS or a re-evaluation of those species that were determined to have moderate or large impacts in the Draft Solar PEIS. The other special status species for this SEZ are identified in Table 11.1.12.1-1 of the Draft Solar PEIS.

[b] BLM-S = listed as sensitive by the BLM; ESA-T = listed as threatened under the ESA; FWS-SC = USFWS species of concern; NV-P = protected in the state of Nevada under Nevada Revised Statutes (NRS) 501.110 (animals) or NRS 527 (plants); NV-S1 = ranked as S1 in the state of Nevada; NV-S2 = ranked as S2 in the state of Nevada.

[c] Potentially suitable habitat was determined by using SWReGAP habitat suitability models (USGS 2004, 2007). Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

**Footnotes continued on next page.**

**TABLE 11.1.12.1-1 (Cont.)**

[d] Maximum area of potentially suitable habitat that could be affected relative to availability within the SEZ region. Habitat availability for each species within the region was determined by using SWReGAP habitat suitability models (USGS 2004, 2007). This approach probably overestimates the amount of suitable habitat in the project area.

[e] Direct effects within the SEZ consist of the ground-disturbing activities associated with construction and maintenance of an altered environment associated with operations.

[f] Area of indirect effects was assumed to be the area adjacent to the SEZ within 5 mi (8 km) of the SEZ boundary where ground-disturbing activities would not occur. Indirect effects include effects from surface runoff, dust, noise, lighting, and so on from project developments. The potential degree of indirect effects would decrease with increasing distance away from the SEZ.

[g] Overall impact magnitude categories were based on professional judgment and are as follows: (1) *small*: ≤1% of the population or its habitat would be lost and the activity would not result in a measurable change in carrying capacity or population size in the affected area; (2) *moderate*: >1 but ≤10% of the population or its habitat would be lost and the activity would result in a measurable but moderate (not destabilizing) change in carrying capacity or population size in the affected area; (3) *large*: >10% of a population or its habitat would be lost and the activity would result in a large, measurable, and destabilizing change in carrying capacity or population size in the affected area. Note that much greater weight was given to the magnitude of direct effects because those effects would be difficult to mitigate. Design features would reduce most indirect effects to negligible levels.

[h] Species-specific mitigations are suggested here, but final mitigations should be developed in consultation with state and federal agencies and should be based on pre-disturbance surveys.

[i] Species in bold text have been recorded or have designated critical habitat within 5 mi (8 km) of the SEZ boundary.

[j] To convert ft to m, multiply by 0.3048.

[k] To convert mi to km, multiply by 1.6093.

[l] To convert acres to $km^2$, multiply by 0.004047.

Solar PEIS. It inhabits desert dunes and desertscrub communities of the Mojave Desert at elevations between 2,000 and 3,600 ft (600 and 1,100 m). The nearest known occurrences are approximately 17 mi (27 km) east of the proposed Amargosa Valley SEZ. Potentially suitable habitat for the species occurs on the SEZ and other portions of the affected area (Table 11.1.12.1-1).

**Crissal Thrasher**

The crissal thrasher is a local and uncommon resident in southern Nevada outside of the Colorado River Valley, where it is a summer breeding resident. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. The species occurs in dense thickets of shrubs or low trees in riparian habitats. On the basis of an evaluation of SWReGAP habitat suitability models for this species, potentially suitable habitat does not occur on the SEZ; however, potentially suitable breeding and nonbreeding habitat may occur outside the SEZ in the area of indirect effects (Table 11.1.12.1-1).

**Golden Eagle**

The golden eagle is an uncommon to common permanent resident in southern Nevada. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. The species inhabits rolling foothills, mountain areas, and desert shrublands. It nests on cliff faces and in large trees in open areas. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.1.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable nesting (cliffs and rock outcrops) does not occur on the SEZ or area of indirect effects (Table 11.1.12.1-1).

**Gray Vireo**

The gray vireo is an uncommon summer resident in southern Nevada. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. The species occurs in arid environments such as pinyon-juniper, chaparral, and desert shrublands. It builds open-cup nests of plant material in forked branches of shrubs or small trees. On the basis of an evaluation of SWReGAP habitat suitability models for this species, potentially suitable habitat does not occur on the SEZ; however, potentially suitable breeding and nonbreeding habitat may occur outside the SEZ in the area of indirect effects (Table 11.1.12.1-1).

**Le Conte's Thrasher**

The Le Conte's thrasher is an uncommon to rare local resident in desert environments of the southwestern United States. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. The species inhabits open desert wash, desertscrub, alkali desertscrub, and desert succulent scrub habitats. It nests in dense, spiny shrubs, or densely branched cactus in desert wash habitat. Potentially suitable foraging and nesting habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.1.12.1-1).

**Loggerhead Shrike**

The loggerhead shrike is a common winter resident in lowlands and foothills of southern Nevada. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. The species occurs in open habitats with shrubs, trees, utility lines, or other perches. Highest density occurs in open-canopied foothill forests. On the basis of an evaluation of SWReGAP habitat suitability models for this species, potentially suitable habitat does not occur on the SEZ; however, potentially suitable foraging habitat may occur outside the SEZ in the area of indirect effects (Table 11.1.12.1-1).

**Long-Eared Owl**

The long-eared owl is an uncommon year-round resident in southern Nevada. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. The species inhabits desert shrubland environments in proximity to riparian areas such as desert washes. It nests in trees using old nests from other birds or squirrels. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.1.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable nesting habitat (forests) does not occur on the SEZ or area of indirect effects (Table 11.1.12.1-1).

**Lucy's Warbler**

The Lucy's warbler is an uncommon summer resident and breeder in desert riparian areas of southern Nevada. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. The species inhabits desert wash habitats, especially those dominated by mesquite and saltcedar. It nests in tiny cavities in riparian woodlands. On the basis of an evaluation of SWReGAP habitat suitability models for this species, potentially suitable habitat does not occur on the SEZ; however, potentially suitable breeding and nonbreeding habitat may occur outside the SEZ in the area of indirect effects (Table 11.1.12.1-1).

**Prairie Falcon**

The prairie falcon occurs throughout the western United States. It is a year-round resident within the Amargosa Valley SEZ region. This species was analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. The species occurs in open habitats in mountainous areas, sagebrush-steppe, grasslands, or cultivated areas. Nests are typically constructed in well-sheltered ledges of rocky cliffs and outcrops. This species occurs in Nye County, Nevada, and potentially suitable foraging habitat occurs on the SEZ and in other portions of the affected area

(Table 11.1.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable nesting habitat (cliffs and rock outcrops) does not occur on the SEZ or within the area of indirect effects.

**Big Brown Bat**

The big brown bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. The big brown bat is uncommon in desert habitats but may occur in desert shrublands that are in close proximity to water sources. The species inhabits desert shrubland environments in proximity to riparian areas such as desert washes. It roosts in buildings, caves, mines, and trees. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.1.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur on the SEZ or area of indirect effects (Table 11.1.12.1-1).

**Brazilian Free-Tailed Bat**

The Brazilian free-tailed bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. The species inhabits woodlands, shrublands, and grasslands. It roosts in caves and crevices. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.1.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (rock outcrops) does not occur on the SEZ or area of indirect effects (Table 11.1.12.1-1).

**California Myotis**

The California myotis is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. The species inhabits desert, chaparral, woodlands, and forests. It roosts primarily in crevices but will also use buildings, mines, and hollow trees. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.1.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur on the SEZ or area of indirect effects (Table 11.1.12.1-1).

**Hoary Bat**

The hoary bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. The species inhabits woodlands, foothills, desert shrublands, and chaparral. It roosts primarily in trees. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.1.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests) does not occur on the SEZ or area of indirect effects (Table 11.1.12.1-1).

**Long-Legged Myotis**

The long-legged myotis is a common to uncommon year-round resident in southern Nevada. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. This species is uncommon in desert and arid grassland environments and most common in woodlands above 4,000-ft (1,219-m) elevation. It forages in chaparral, scrub, woodlands, and desert shrublands and roosts in trees, caves, and crevices. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.1.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur on the SEZ or area of indirect effects (Table 11.1.12.1-1).

**Silver-Haired Bat**

The silver-haired bat is an uncommon year-round resident in southern Nevada. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. The species inhabits coniferous forests, foothill woodlands, and montane riparian habitats. It may also forage in desert shrublands. This species primarily roosts in hollow trees. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.1.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests) does not occur on the SEZ or area of indirect effects (Table 11.1.12.1-1).

**Western Pipistrelle**

The western pipistrelle is a common year-round resident in southern Nevada. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. The species inhabits mountain foothill woodlands, desert shrublands, desert washes, and pinyon-juniper woodlands. It roosts primarily in rock crevices and occasionally in mines and caves. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.1.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (rock outcrops) does not occur on the SEZ or area of indirect effects (Table 11.1.12.1-1).

***11.1.12.1.3 Rare Species***

There are three rare species (ranked S1 or S2 in Nevada) that have not been discussed as ESA-listed species (Section 11.1.12.1.1) or BLM-designated sensitive (Section 11.1.12.1.2): the

Ash Meadows buckwheat, Panamint Mountains bedstraw, and weasel phacelia. These three species were analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS, and they are re-evaluated in this Final Solar PEIS. Each of these species has the potential to occur in the SEZ and portions of the area of indirect effects. Of these species, however, only the Ash Meadows buckwheat is known to occur within 5 mi (8 km) of the proposed Amargosa Valley SEZ (Table 11.1.12.1-1).

#### 11.1.12.2 Impacts

Overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the special status species' habitat within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of the special status species' habitat would be lost; and (3) *large*: >10% of the special status species' habitat would be lost.

As presented in the Draft Solar PEIS, solar energy development within the Amargosa Valley SEZ could affect potentially suitable habitats of special status species. The analysis presented in the Draft Solar PEIS for the original Amargosa Valley SEZ developable area indicated that development would result in no impact or a small overall impact on most special status species (Table 11.1.12.1-1 in the Draft Solar PEIS). However, development was determined to result in moderate or large impacts on some special status species. In the Draft Solar PEIS, those 25 special status species that could be affected by groundwater withdrawals on the SEZ were determined to have impacts that ranged from small to large depending upon the scale of development and water needs to serve development on the SEZ. Development within the revised Amargosa Valley SEZ could still affect the same 52 species evaluated in the Draft Solar PEIS. However, the reduction in the SEZ boundaries and in the developable area of the Amargosa Valley SEZ would result in reduced impact levels compared to original estimates in the Draft Solar PEIS. Pre-disturbance consultation with the BLM and the necessary state and federal agencies should be conducted to determine the project-specific water needs and the potential for impact on these species (these groundwater-dependent species are listed in Table 11.1.12.1-1 of the Draft Solar PEIS and are listed below in Section 11.1.12.3). Those seven species that were determined to have moderate or large impacts in the Draft Solar PEIS are discussed below. Species for which overall impacts were determined to be small in the Draft Solar PEIS are not discussed because impacts on these species in the revised SEZ footprint are expected to remain small.

In addition, impacts on the 14 BLM-designated sensitive species that were not evaluated for the Amargosa Valley SEZ in the Draft Solar PEIS are discussed below and in Table 11.1.12.1-1. The impact assessment for these additional species was carried out in the same way as for those species analyzed in the Draft Solar PEIS (Section 11.1.12.2 of the Draft Solar PEIS).

#### *11.1.12.2.1 Impacts on Species Listed under the Endangered Species Act*

The desert tortoise is listed as threatened under the ESA and is known to occur throughout the SEZ affected area. This species was evaluated in the Draft Solar PEIS. It is widespread in Mojave desertscrub communities where firm soils for digging burrows are present. The desert tortoise has the potential to occur within the revised SEZ on the basis of observed occurrences on and near the SEZ and the presence of apparently suitable habitat in the SEZ (Figure 11.1.12.1-1; Table 11.1.12.1-1). According to habitat suitability models, approximately 8,470 acres (34 $km^2$) of potentially suitable habitat on the revised SEZ could be directly affected by construction and operations of solar energy development on the revised SEZ (Table 11.1.12.1-1). This direct effects area represents about 0.3% of available suitable habitat of the desert tortoise in the region. Much of this habitat within the SEZ is considered to be highly suitable (modeled suitability value ≥0.8 out of 1.0) according to the USGS desert tortoise habitat suitability model (Nussear et al. 2009). About 92,000 acres (372 $km^2$) of suitable habitat occurs in the area of potential indirect effects; this area represents about 3.4% of the available suitable habitat in the region (Table 11.1.12.1-1).

Information provided by the USFWS since the publication of the Draft Solar PEIS has identified the revised Amargosa Valley SEZ as being situated in an area that provides habitat and genetic connectivity between areas with greater habitat suitability (Ashe 2012). The USFWS has also determined that some portions of the SEZ are within high-priority connectivity areas, which are necessary to facilitate natural processes of gene exchange between populations in order to maintain population viability. Solar energy development on the Amargosa Valley SEZ, therefore, may isolate and fragment these tortoise populations by creating impediments to natural migration patterns.

In the Draft Solar PEIS, it was determined that the overall impact on the desert tortoise from solar energy development within the Amargosa Valley SEZ would be moderate, because the amount of potentially suitable habitat in the area of direct effects represents greater than 1% but less than 10% of potentially suitable habitat in the region. On the basis of the revised SEZ boundaries, the overall impact on the desert tortoise from construction, operation, and decommissioning of utility-scale solar facilities within the revised Amargosa Valley SEZ is considered to be small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features alone is unlikely to reduce these impacts to negligible levels. Avoidance of potentially suitable habitats for this species is not a feasible means of mitigating impacts, because these habitats (desertscrub) are widespread throughout the area of direct effects. Preconstruction surveys to determine the abundance of desert tortoises on the SEZ and the implementation of a desert tortoise translocation plan and compensation plan could further reduce direct impacts.

Development of actions to reduce impacts (e.g., reasonable and prudent alternatives, reasonable and prudent measures, and terms and conditions) for the desert tortoise would require formal consultation with the USFWS under Section 7 of the ESA. This project-level consultation will tier from the programmatic ESA Section 7 consultation that will be completed with the PEIS ROD. Priority should be given to the development of a thorough survey protocol and measures to avoid impacts on known tortoise populations. If necessary, minimization measures and mitigation measures, which could potentially include translocation actions and compensatory mitigation, may be required. These consultations may be used to authorize incidental take statements per Section 10 of the ESA (if necessary). Consultation with the NDOW should also occur to determine any state mitigation requirements.

Inherent dangers to tortoises are associated with their capture, handling, and translocation from the SEZ. These actions, if conducted improperly, can result in injury or death. To minimize these risks and as stated above, the desert tortoise translocation plan should be developed in consultation with the USFWS and should follow the *Guidelines for Handling Desert Tortoises During Construction Projects* (Desert Tortoise Council 1994) and other current translocation guidance provided by the USFWS. Consultation will identify potentially suitable recipient locations, density thresholds for tortoise populations in recipient locations, and procedures for pre-disturbance clearance surveys and tortoise handling, as well as disease-testing and post-translocation monitoring and reporting requirements. Despite some risk of mortality or decreased fitness, translocation is widely accepted as a useful strategy for the conservation of the desert tortoise (Field et al. 2007).

To offset impacts of solar development on the SEZ, compensatory mitigation may be needed to balance the acreage of habitat lost with acquisition of lands that would be improved and protected for desert tortoise populations (USFWS 1994). Compensation can be accomplished by improving the carrying capacity for the desert tortoise on the acquired lands. Other mitigation actions may include funding for the habitat enhancement of the desert tortoise on existing federal lands. Consultation with the USFWS and NDOW would be necessary to determine the appropriate mitigation ratio to acquire, enhance, and preserve desert tortoise compensation lands.

#### *11.1.12.2.2 Impacts on BLM-Designated Sensitive Species*

Impacts on the 18 BLM-designated sensitive species that either were re-evaluated for this Final Solar PEIS or are new species determined to potentially occur in the Amargosa Valley SEZ affected area are discussed below.

**Death Valley Beardtongue**

The Death Valley beardtongue was analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. The species is not known to occur in the affected area of the revised Amargosa Valley SEZ; however, approximately 6,780 acres (27 km$^2$) of potentially suitable habitat on the revised SEZ could be directly affected by construction and operations (Table 11.1.12.1-1). This direct effects area represents about 0.4% of potentially suitable habitat in the SEZ region. About 95,000 acres (384 km$^2$) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 3.9% of the available suitable habitat in the SEZ region (Table 11.1.12.1-1).

In the Draft Solar PEIS, it was determined that the overall impact on the Death Valley beardtongue from solar energy development within the proposed Amargosa Valley SEZ was moderate, because the amount of potentially suitable habitat for this species in the area of direct effects represents greater than 1% but less than 10% of potentially suitable habitat in the region. On the basis of the revised SEZ boundaries, the overall impact on the Death Valley beardtongue from construction, operation, and decommissioning of utility-scale solar facilities within the revised Amargosa Valley SEZ is considered to be small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region.

Avoidance of all potentially suitable habitats is not a feasible means to mitigate impacts on the Death Valley beardtongue, because potentially suitable desertscrub habitat is widespread throughout the area of direct effects. Impacts could be reduced by conducting pre-disturbance surveys and avoiding or minimizing disturbance to occupied habitats on the SEZ. If avoidance or minimization is not a feasible option, plants could be translocated from areas of direct effects to protected areas that would not be affected directly or indirectly by future development. Alternatively, or in combination with translocation, a compensatory mitigation plan could be developed and implemented to offset direct effects on occupied habitats. Compensation could involve the protection and enhancement of existing occupied or suitable habitats to compensate for habitats lost to development. A comprehensive mitigation strategy that uses one or more of these options could be designed to completely offset the impacts of development.

**White-Margined Beardtongue**

The white-margined beardtongue was analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. The species is not known to occur in the affected area of the revised Amargosa Valley SEZ; however, approximately 6,780 acres (27 $km^2$) of potentially suitable habitat on the SEZ could be directly affected by construction and operations (Table 11.1.12.1-1). This direct effects area represents about 0.3% of potentially suitable habitat in the SEZ region. About 96,150 acres (389 $km^2$) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 3.9% of the potentially suitable habitat in the SEZ region (Table 11.1.12.1-1).

In the Draft Solar PEIS, it was determined that the overall impact on the white-margined beardtongue from solar energy development within the proposed Amargosa Valley SEZ was moderate, because the amount of potentially suitable habitat for this species in the area of direct effects represents greater than 1% but less than 10% of potentially suitable habitat in the region. On the basis of the revised SEZ boundaries, the overall impact on the white-margined beardtongue from construction, operation, and decommissioning of utility-scale solar facilities within the revised Amargosa Valley SEZ is considered to be small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region.

Avoidance of all potentially suitable habitats is not a feasible way to mitigate impacts on the white-margined beardtongue, because potentially suitable desertscrub habitat is widespread throughout the area of direct effects. However, impacts could be reduced to negligible levels with the implementation of programmatic design features and the mitigation options described previously for the Death Valley beardtongue. The need for mitigation, other than programmatic design features, should be determined by conducting preconstruction surveys for the species and its habitat on the SEZ.

**Crissal Thrasher**

The crissal thrasher was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. This species is a local and uncommon resident in southern Nevada outside of the Colorado River Valley, where it is a summer breeding resident. The crissal thrasher is not known to occur on the revised Amargosa Valley SEZ, and suitable habitat is not expected to occur on the SEZ; however, on the basis of an evaluation of the SWReGAP habitat suitability model for this species, approximately 85 acres (0.3 km$^2$) of potentially suitable breeding and nonbreeding habitat may occur outside the SEZ in the area of indirect effects. This area represents about 2.1% of the potentially suitable foraging habitat in the SEZ region (Table 11.1.12.1-1).

The overall impact on the crissal thrasher from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Amargosa Valley SEZ is considered small, because no potentially suitable habitat for this species occurs in the area of direct effects and only indirect effects are possible. The implementation of programmatic design features may be sufficient to reduce indirect impacts on this species to negligible levels.

**Golden Eagle**

The golden eagle was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. This species is an uncommon to common permanent resident in southern Nevada, and potentially suitable foraging habitat is expected to occur in the affected area. Approximately 8,470 acres (34 km$^2$) of potentially suitable foraging habitat on the SEZ could be directly affected by construction and operations (Table 11.1.12.1-1). This direct effects area represents 0.3% of potentially suitable habitat in the SEZ region. About 110,000 acres (445 km$^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 3.9% of the available suitable foraging habitat in the SEZ region (Table 11.1.12.1-1). Most of this area could serve as foraging habitat (open shrublands). On the basis of an evaluation of SWReGAP land cover types, potentially suitable nesting habitat (cliffs and rock outcrops) does not occur on the SEZ or within the area of indirect effects.

The overall impact on the golden eagle from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Amargosa Valley SEZ is considered small, because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents less than 1% of potentially suitable foraging habitat in the SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of direct impacts on all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the golden eagle, because potentially suitable shrubland is widespread throughout the area of direct effects and readily available in other portions of the affected area.

### Gray Vireo

The gray vireo was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. This species is an uncommon summer resident in southern Nevada. The gray vireo is not known to occur on the revised Amargosa Valley SEZ, and suitable habitat is not expected to occur on the SEZ; however, on the basis of an evaluation of the SWReGAP habitat suitability model for this species, approximately 6,200 acres (25 $km^2$) of potentially suitable breeding and nonbreeding habitat may occur outside the SEZ in the area of indirect effects. This area represents about 1.7% of the potentially suitable foraging habitat in the SEZ region (Table 11.1.12.1-1).

The overall impact on the gray vireo from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Amargosa Valley SEZ is considered small, because no potentially suitable habitat for this species occurs in the area of direct effects and only indirect effects are possible. The implementation of programmatic design features may be sufficient to reduce indirect impacts on this species to negligible levels.

### Le Conte's Thrasher

The Le Conte's thrasher is an uncommon to rare local resident in desert environments of the southwestern United States. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. The species inhabits open desert wash, desert scrub, alkali desertscrub, and desert succulent scrub habitats. Approximately 8,470 acres (34 $km^2$) of potentially suitable foraging or nesting habitat on the SEZ could be directly affected by construction and operations (Table 11.1.12.1-1). This direct effects area represents 0.6% of potentially suitable habitat in the SEZ region. About 101,350 acres (410 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 6.8% of the available suitable foraging habitat in the SEZ region (Table 11.1.12.1-1).

The overall impact on the Le Conte's thrasher from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Amargosa Valley SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts to negligible levels.

Avoidance of all potentially suitable habitats is not a feasible way to mitigate impacts on the Le Conte's thrasher, because potentially suitable shrubland habitat is widespread throughout the area of direct effects and readily available in other portions of the SEZ region. Impacts on the Le Conte's thrasher could be reduced by conducting pre-disturbance surveys and avoiding or minimizing disturbance to occupied nests in the area of direct effects. If avoidance or minimization is not a feasible option, a compensatory mitigation plan could be developed and implemented to offset direct effects on occupied habitats. Compensation could involve the protection and enhancement of existing occupied or suitable habitats to make up for habitats lost to development. A comprehensive mitigation strategy that uses one or both of these options could be designed to completely offset the impacts of development. The need for mitigation, other than design features, should be determined by conducting pre-disturbance surveys for the species and its habitat in the area of direct effects.

**Loggerhead Shrike**

The loggerhead shrike was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. This species is a common winter resident in lowlands and foothills of southern Nevada. The loggerhead shrike is not known to occur on the revised Amargosa Valley SEZ, and suitable habitat is not expected to occur on the SEZ; however, on the basis of an evaluation of the SWReGAP habitat suitability model for this species, approximately 22,900 acres (93 $km^2$) of potentially suitable foraging habitat may occur outside the SEZ in the area of indirect effects. This area represents about 1.0% of the potentially suitable foraging habitat in the SEZ region (Table 11.1.12.1-1).

The overall impact on the loggerhead shrike from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Amargosa Valley SEZ is considered small, because no potentially suitable habitat for this species occurs in the area of direct effects and only indirect effects are possible. The implementation of programmatic design features may be sufficient to reduce indirect impacts on this species to negligible levels.

**Long-Eared Owl**

The long-eared owl is an uncommon year-round resident in southern Nevada. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. The species inhabits desert shrubland environments in proximity to riparian areas such as desert washes. It nests in trees using old nests from other birds or squirrels. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.1.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable nesting habitat (forests) does not occur on the SEZ or within the area of indirect effects (Table 11.1.12.1-1).

The long-eared owl was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. This species is an uncommon to common permanent resident in southern Nevada, and potentially suitable foraging habitat is expected to occur in the affected area. Approximately 8,470 acres (34 $km^2$) of potentially suitable foraging habitat on the SEZ could be directly affected by construction and operations (Table 11.1.12.1-1). This direct effects area represents 0.3% of potentially suitable habitat in the SEZ region. About 101,500 acres (411 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 4.1% of the available suitable foraging habitat in the SEZ region (Table 11.1.12.1-1).

The overall impact on the long-eared owl from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Amargosa Valley SEZ is considered small, because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents less than 1% of potentially suitable foraging habitat in the SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of direct impacts on all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the long-eared owl, because potentially suitable shrubland is widespread throughout the area of direct effects and readily available in other portions of the affected area.

**Lucy's Warbler**

The Lucy's warbler was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. This species is an uncommon summer resident and breeder in desert riparian areas of southern Nevada. The Lucy's warbler is not known to occur on the revised Amargosa Valley SEZ, and suitable habitat is not expected to occur on the SEZ; however, on the basis of an evaluation of the SWReGAP habitat suitability model for this species, approximately 85 acres (0.3 km$^2$) of potentially suitable foraging or nesting habitat may occur outside the SEZ in the area of indirect effects. This area represents about 1.9% of the potentially suitable foraging habitat in the SEZ region (Table 11.1.12.1-1).

The overall impact on the Lucy's warbler from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Amargosa Valley SEZ is considered small, because no potentially suitable habitat for this species occurs in the area of direct effects and only indirect effects are possible. The implementation of programmatic design features may be sufficient to reduce indirect impacts on this species to negligible levels.

**Prairie Falcon**

The prairie falcon occurs throughout the western United States. It is a year-round resident within the Amargosa Valley SEZ region. This species was analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. The species occurs in open habitats in mountainous areas, sagebrush-steppe, grasslands, or cultivated areas. Nests are typically constructed in well-sheltered ledges of rocky cliffs and outcrops. Approximately 8,470 acres (34 km$^2$) of potentially suitable habitat on the revised SEZ could be directly affected by construction and operations (Table 11.1.12.1-1). This direct effects area represents 0.4% of potentially suitable habitat in the SEZ region. About 105,000 acres (425 km$^2$) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 4.5% of the potentially suitable habitat in the SEZ region (Table 11.1.12.1-1). Most of this area could serve as foraging habitat (open shrublands). On the basis of an evaluation of SWReGAP land cover types, potentially suitable nesting habitat (cliffs and rock outcrops) does not occur on the SEZ or within the area of indirect effects.

In the Draft Solar PEIS, it was determined that the overall impact on the prairie falcon from solar energy development within the proposed Amargosa Valley SEZ was moderate, because the amount of potentially suitable habitat for this species in the area of direct effects represents greater than 1% but less than 10% of potentially suitable habitat in the region. On the basis of the revised SEZ boundaries, the overall impact on the prairie falcon from construction, operation, and decommissioning of utility-scale solar facilities within the revised Amargosa Valley SEZ is considered to be small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region.

The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitats to mitigate impacts on the prairie falcon is not feasible, because potentially suitable foraging habitats are widespread throughout the area of direct effects and readily available in other portions of the affected area.

**Big Brown Bat**

The big brown bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. Suitable roosting habitats (caves, forests, and buildings) are not expected to occur on the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 8,470 acres (34 $km^2$) of potentially suitable foraging habitat on the revised SEZ could be directly affected by construction and operations (Table 11.1.12.1-1). This direct effects area represents about 0.6% of potentially suitable foraging habitat in the region. About 105,000 acres (425 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 7.0% of the available suitable foraging habitat in the region (Table 11.1.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable roosting habitat (forests and rock outcrops) exists within the SEZ or within the area of indirect effects.

The overall impact on the big brown bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Amargosa Valley SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

**Brazilian Free-Tailed Bat**

The Brazilian free-tailed bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. Suitable roosting habitats (caves, forests, and buildings) are not expected to occur on the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 8,470 acres (34 $km^2$) of potentially suitable foraging habitat on the revised SEZ could be directly affected by construction and operations (Table 11.1.12.1-1). This direct effects area represents about 0.5% of potentially suitable foraging habitat in the region. About 106,000 acres (429 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 5.9% of the available suitable foraging habitat in the region (Table 11.1.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable roosting habitat (forests and rock outcrops) exists within the SEZ or within the area of indirect effects.

The overall impact on the Brazilian free-tailed bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Amargosa Valley SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

**California Myotis**

The California myotis is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests and rock outcrops) are not expected to occur on the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 8,470 acres (34 $km^2$) of potentially suitable foraging habitat on the revised SEZ could be directly affected by construction and operations (Table 11.1.12.1-1). This direct effects area represents about 0.4% of potentially suitable foraging habitat in the region. About 105,000 acres (425 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 5.3% of the available suitable foraging habitat in the region (Table 11.1.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable roosting habitat (forests and rock outcrops) exists within the SEZ or within the area of indirect effects.

The overall impact on the California myotis from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Amargosa Valley SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

### Hoary Bat

The hoary bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests) are not expected to occur on the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 8,470 acres (34 $km^2$) of potentially suitable foraging habitat on the revised SEZ could be directly affected by construction and operations (Table 11.1.12.1-1). This direct effects area represents about 0.5% of potentially suitable foraging habitat in the region. About 105,000 acres (425 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 5.8% of the available suitable foraging habitat in the region (Table 11.1.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable roosting habitat (forests) exists within the SEZ or within the area of indirect effects.

The overall impact on the hoary bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Amargosa Valley SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

### Long-Legged Myotis

The long-legged myotis is a common to uncommon year-round resident in southern Nevada. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests and rock outcrops) are not expected to occur on the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 8,470 acres (34 $km^2$) of potentially suitable foraging habitat on the revised SEZ could be directly affected by construction and operations (Table 11.1.12.1-1). This direct effects area represents about 0.5% of potentially suitable foraging habitat in the region. About 105,000 acres (425 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 5.8% of the available suitable foraging habitat in the region (Table 11.1.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable roosting habitat (forests and rock outcrops) exists within the SEZ or within the area of indirect effects.

The overall impact on the long-legged myotis from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Amargosa Valley SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

### Silver-Haired Bat

The silver-haired bat is an uncommon year-round resident in southern Nevada. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests) are not expected to occur on the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 8,470 acres (34 $km^2$) of potentially suitable foraging habitat on the revised SEZ could be directly affected by construction and operations (Table 11.1.12.1-1). This direct effects area represents about 0.6% of potentially suitable foraging habitat in the region. About 105,000 acres (425 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 7.5% of the available suitable foraging habitat in the region (Table 11.1.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable roosting habitat (forests) exists within the SEZ or within the area of indirect effects.

The overall impact on the silver-haired bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Amargosa Valley SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

### Western Pipistrelle

The western pipistrelle is a common year-round resident in southern Nevada. This species was not analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests and rock outcrops) are not expected to occur on the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 8,470 acres (34 $km^2$) of potentially suitable foraging habitat on the revised SEZ could be directly affected by construction and operations (Table 11.1.12.1-1). This direct effects area represents about 0.3% of potentially suitable foraging habitat in the region. About 105,000 acres (425 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 4.3% of the available suitable foraging habitat in the region (Table 11.1.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable roosting habitat (forests and rock outcrops) exists within the SEZ or within the area of indirect effects.

The overall impact on the western pipistrelle from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Amargosa Valley SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

#### *11.1.12.2.3 Impacts on Rare Species*

There are three rare species (ranked S1 or S2 in Nevada) that have not been discussed as ESA-listed species (Section 11.1.12.1.1) or BLM-designated sensitive (Section 11.1.12.1.2): the Ash Meadows buckwheat, Panamint Mountains bedstraw, and weasel phacelia. These three species were analyzed for the Amargosa Valley SEZ in the Draft Solar PEIS and they are re-evaluated in this Final Solar PEIS. Each of these species has the potential to occur in the revised SEZ and portions of the area of indirect effects. Of these species, however, only the Ash Meadows buckwheat is known to occur within 5 mi (8 km) of the revised Amargosa Valley SEZ (Table 11.1.12.1-1). Impacts on these species are presented in Table 11.1.12.1-1.

### 11.1.12.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on special status and rare species are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific resources and conditions will determine how programmatic design features are applied, for example:

- Pre-disturbance surveys shall be conducted within the SEZ to determine the presence and abundance of special status species, including those identified in Table 11.1.12.1-1 of the Draft Solar PEIS, as well as those additional species presented in Table 11.1.12.1-1 of this Final Solar PEIS. Disturbance to occupied habitats for these species shall be avoided or minimized to the extent practicable. If avoiding or minimizing impacts on occupied habitats is not possible, translocation of individuals from areas of direct effects or compensatory mitigation of direct effects on occupied habitats may be used to reduce impacts. A comprehensive mitigation strategy for special status species that uses one or more of these options to offset the impacts of development shall be developed in coordination with the appropriate federal and state agencies.

- Disturbance to desert wash or riparian habitats on the SEZ shall be avoided or minimized to reduce impacts on the Bullfrog Hills sweetpea, Holmgren lupine, phainopepla, and Le Conte’s thrasher.

- Groundwater withdrawals from the Amargosa Desert Basin to serve solar energy development on the SEZ shall be avoided or limited to reduce or prevent impacts on the following 25 groundwater-dependent special status species that may occur more than 5 mi (8 km) from the SEZ boundary: Amargosa niterwort, Ash Meadows blazingstar, Ash Meadows gumplant, Ash Meadows ivesia, Ash Meadows sunray, spring-loving centaury, Amargosa tryonia, Ash Meadows pebblesnail, crystal springsnail, distal gland springsnail, elongate gland springsnail, Fairbanks springsnail, median gland springsnail, minute tryonia, Oasis Valley springsnail, Point of Rocks tryonia, sporting goods tryonia, Amargosa naucorid, Ash Meadows naucorid, Ash Meadows Amargosa pupfish, Ash Meadows speckled dace, Devils Hole pupfish, Oasis Valley speckled dace, Warm Springs Amargosa pupfish, and Amargosa toad.

- Consultation with the USFWS and NDOW shall be conducted to address the potential for impacts on the following 12 species listed as threatened or endangered under the ESA that may be affected by solar energy development on the SEZ: Amargosa niterwort, Ash Meadows blazingstar, Ash Meadows gumplant, Ash Meadows ivesia, Ash Meadows sunray, spring-loving centaury, Ash Meadows naucorid, Ash Meadows Amargosa pupfish, Ash Meadows speckled dace, Devils Hole pupfish, Warm Springs Amargosa pupfish, and desert tortoise. Consultation would identify an appropriate survey protocol, avoidance and minimization measures, and, if appropriate, reasonable and prudent alternatives, reasonable and prudent measures, and terms and conditions for incidental take statements.

- Coordination with the USFWS and NDOW shall be conducted for the following 16 species under review for listing under the ESA that may be affected by solar energy development on the SEZ: Amargosa tryonia, Ash Meadows pebblesnail, crystal springsnail, distal gland springsnail, elongate gland springsnail, Fairbanks springsnail, median gland springsnail, minute tryonia, Oasis Valley springsnail, Point of Rocks tryonia, sporting goods tryonia, Amargosa naucorid, Oasis Valley speckled dace, and Amargosa toad. Coordination would identify an appropriate survey protocol, and mitigation requirements, which may include avoidance, minimization, translocation, or compensation.

- Coordination with the USFWS and NDOW shall be conducted to address potential indirect impacts (e.g., site runoff and erosion) and the effectiveness of design features for the following special status species that are endemic to the Big Dune system: Big Dune meloderes weevil, Giuliani's dune scarab beetle, and large aegialian scarab beetle.

It is anticipated that implementation of these programmatic design features will reduce the majority of impacts on the special status species from habitat disturbance and groundwater use.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for special status species have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis. Projects will comply with terms and conditions set forth by the USFWS Biological Opinion resulting from the programmatic consultation and any necessary project-specific ESA Section 7 consultations.

## 11.1.13 Air Quality and Climate

### 11.1.13.1 Affected Environment

Except as noted below, the information for air quality and climate presented in the affected environment section of the Draft Solar PEIS remains essentially unchanged.

#### *11.1.13.1.1 Existing Air Emissions*

The Draft Solar PEIS presented Nye County emissions data for 2002. More recent data for 2008 (EPA 2011a) were reviewed. The two emissions inventories are from different sources and assumptions; for example, the 2008 data did not include biogenic volatile organic compound (VOC) emissions. All emissions except particulate matter with a diameter of 10 µm or less ($PM_{10}$) were lower in the more recent data. $PM_{10}$ emissions were about 54% higher in the 2008 data, and emissions of particulate matter with a diameter of 2.5 µm or less ($PM_{2.5}$) were about 73% of those in the 2002 data. However, these changes would not affect modeled air quality impacts presented in this update.

#### *11.1.13.1.2 Air Quality*

The calendar quarterly average National Ambient Air Quality Standard (NAAQS) of 1.5 $\mu g/m^3$ for lead (Pb) presented in Table 11.1.13.1-2 of the Draft Solar PEIS has been replaced by the rolling 3-month standard (0.15 $\mu g/m^3$). The federal 24-hour and annual sulfur dioxide ($SO_2$) and 1-hour ozone ($O_3$) have been revoked as well (EPA 2011b). These changes will not affect the modeled air quality impacts presented in this Final Solar PEIS. Nevada State Ambient Air Quality Standards (SAAQS) have not been changed.

Given the reduced size of the proposed Amargosa Valley SEZ, the distances to nearby Class I areas are larger by a few miles than those in the Draft Solar PEIS. The conclusion in the Draft Solar PEIS that no Class I areas are within the 100-km (62-mi) distance within which the EPA recommends notification of Federal Land Managers remains valid.

### 11.1.13.2 Impacts

#### *11.1.13.2.1 Construction*

**Methods and Assumptions**

Except for the area disturbed at any one time during construction, the methods and modeling assumptions have not changed from those presented in the Draft Solar PEIS. On the basis of the reduced size of the proposed Amargosa Valley SEZ, for this Final Solar PEIS air quality was remodeled by assuming that a maximum of 3,000 acres (12.14 $km^2$) in the southern portion of the proposed SEZ (the area closest to nearby residences) would be disturbed at any one time; the Draft Solar PEIS assumed disturbance of an area three times larger.[1]

**Results**

Potential particulate impacts on air quality from construction were remodeled based on the revised boundaries of the proposed Amargosa Valley SEZ. Changes in magnitude to predicted impacts at the boundary would be expected to be larger than changes at greater distances from the SEZ. Table 11.1.13.2-1 presents the updated maximum modeled concentrations from construction fugitive dust.

The updated maximums are lower by about 30% than those in the Draft Solar PEIS (as would be expected given the reduction in the area assumed disturbed), but totals, except for annual $PM_{2.5}$, could still exceed the NAAQS/SAAQS levels. These updated predictions are still consistent with the conclusion in the Draft Solar PEIS that maximum particulate levels in the vicinity of the SEZ could exceed the standard levels used for comparison. These high $PM_{10}$ concentrations would be limited to the immediate areas surrounding the SEZ boundaries and would decrease quickly with distance.

Other locations modeled include Big Dune, the nearest residences, nearby schools, the truck stop at the intersection of U.S. 95 and State Route 373, and Ash Meadows NWR. The updated analysis conducted for this Final Solar PEIS predicted concentrations at all modeled locations lower than those in the Draft Solar PEIS and showed no locations with predicted concentrations above the NAAQS levels.

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[1] At this programmatic level, detailed information on construction activities, such as facility size, type of solar technology, heavy equipment fleet, activity level, work schedule, and so on, is not known; thus air quality modeling cannot be conducted. It has been assumed that an area of 3,000 acres (12.14 $km^2$) would be disturbed continuously, so the modeling results and discussion here should be interpreted in that context. During the site-specific project phase, more detailed information would be available and more realistic air quality modeling analysis could be conducted. It is likely that impacts on ambient air quality predicted for specific projects would be much lower than those in this Final Solar PEIS.

**TABLE 11.1.13.2-1 Maximum Air Quality Impacts from Emissions Associated with Construction Activities for the Proposed Amargosa Valley SEZ as Revised**

| | | | Concentration ($\mu g/m^3$) | | | | Percentage of NAAQS/SAAQS | |
|---|---|---|---|---|---|---|---|---|
| Pollutant[a] | Averaging Time | Rank[b] | Maximum Increment[b] | Background[c] | Total | NAAQS/ SAAQS | Increment | Total |
| $PM_{10}$ | 24 hour | H6H | 340 | 66 | 406 | 150 | 227 | 271 |
| | Annual | –[d] | 67.5 | 17 | 84.5 | 50 | 135 | 169 |
| $PM_{2.5}$ | 24 hour | H8H | 27.1 | 12.9 | 40.0 | 35 | 77 | 114 |
| | Annual | – | 6.7 | 4.9 | 11.7 | 15 | 45 | 78 |

[a] $PM_{2.5}$ = particulate matter with a diameter of ≤2.5 μm; $PM_{10}$ = particulate matter with a diameter of ≤10 μm.

[b] Concentrations for attainment demonstration are presented. H6H = highest of the sixth-highest concentrations at each receptor over the 5-year period. H8H = highest of the multiyear average of the eighth-highest concentrations at each receptor over the 5-year period. For the annual average, multiyear averages of annual means over the 5-year period are presented. Maximum concentrations are predicted to occur at the site boundaries.

[c] See Table 11.1.13.1-2 of the Draft Solar PEIS.

[d] A dash indicates not applicable.

Updated 24-hour and annual $PM_{10}$ concentration increments at the surrogate receptors[2] for the nearest Class I area—John Muir WA in California—would be lower than those in the Draft Solar PEIS, but the Class I PSD increment for 24-hour $PM_{10}$ could still be exceeded. However, the predicted 24-hour $PM_{10}$ increment in the John Muir WA has been updated from a value exceeding the Class I PSD increment for 24-hour $PM_{10}$ in the Draft Solar PEIS to a value of about 50% of the increment in this Final Solar PEIS, considering the same decay ratio with distance.

The conclusions in the Draft Solar PEIS remain valid. The predicted 24-hour and annual $PM_{10}$ and 24-hour $PM_{2.5}$ concentration levels could exceed the standard levels used for comparison at the SEZ boundaries and in the immediately surrounding areas during the construction of solar facilities. To reduce potential impacts on ambient air quality and in compliance with programmatic design features, aggressive dust control measures would be used. Potential air quality impacts on nearby communities would be much lower. Modeling indicates that air quality impacts from construction activities are anticipated to be less than the Class I PSD $PM_{10}$ increments at the nearest federal Class I area. Construction activities are not subject to the PSD program, and the comparison provides only a screen for gauging the size of the

[2] Because the nearest Class I area is more than 31 mi (50 km) from the SEZ (which exceeds the maximum modeling distance), several regularly spaced receptors in the directions of the nearest Class I area were selected as surrogates for the Prevention of Significant Deterioration (PSD) analysis.

impact. Accordingly, it is anticipated that impacts of construction activities on ambient air quality would be moderate and temporary.

Considering the reduced size of the SEZ, emissions from construction equipment and vehicles would be less than those mentioned in the Draft Solar PEIS. Any potential impacts on air quality-related values (AQRVs) at nearby federal Class I areas would be less; thus the conclusions in the Draft Solar PEIS remain valid. Emissions from construction-related equipment and vehicles are temporary and could cause some unavoidable but short-term impacts.

#### *11.1.13.2.2 Operations*

The reduction in the developable area of the proposed Amargosa Valley SEZ by about 73% from 31,625 acres (128.0 $km^2$) to 8,479 acres (34.3 $km^2$) reduces the generating capacity and annual power generation by a similar percentage and thus reduces the potentially avoided emissions presented in the Draft Solar PEIS. Total revised power generation capacity ranging from 754 to 1,357 MW is estimated for the revised Amargosa Valley SEZ for various solar technologies (see Section 11.1.1.2). As explained in the Draft Solar PEIS, the estimated amount of emissions avoided for the solar technologies evaluated depends only on the megawatts of conventional fossil fuel–generated power avoided.

Table 11.1.13.2-2 in the Draft Solar PEIS provided estimates for emissions potentially avoided by a solar facility. These estimates were updated by reducing the tabulated estimates by about 27%, as shown in the revised Table 11.1.13.2-2. For example, for the technologies estimated to require 9 acres/MW (power tower, dish engine, and PV), up to 1,598 tons of $NO_x$ per year (= 26.81% × the low-end value of 5,960 tons per year tabulated in the Draft Solar PEIS) could be avoided by full solar development of the revised area of the proposed Amargosa Valley SEZ. Although the total emissions avoided by full solar development of the proposed SEZ are considerably reduced from those presented in the Draft Solar PEIS, the conclusions of the Draft Solar PEIS remain valid; that is, if the proposed Amargosa Valley SEZ were fully developed, it is expected that the emissions avoided could be substantial. Power generation from fossil fuel–fired power plants accounts for about 93% of the total electric power generated in Nevada, for which the contributions of natural gas and coal combustion are comparable. Thus, solar facilities to be built in the Amargosa Valley SEZ could be more important than those built in other states in terms of avoiding fuel combustion–related emissions.

#### *11.1.13.2.3 Decommissioning and Reclamation*

The discussion in the Draft Solar PEIS remains valid. Decommissioning and reclamation activities would be of short duration, and their potential impacts on air quality would be minor and temporary.

**TABLE 11.1.13.2-2 Annual Emissions from Combustion-Related Power Generation Displaced by Full Solar Development of the Proposed Amargosa Valley SEZ as Revised**

| Area Size (acres)[a] | Capacity (MW)[b] | Power Generation (GWh/yr)[c] | Emissions Avoided (tons/yr; $10^3$ tons/yr for $CO_2$)[d] | | | |
|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_x$ | Hg | $CO_2$ |
| 8,479 | 754–1,357 | 1,320–2,377 | 1,863–3,353 | 1,598–2,876 | 0.011–0.019 | 1,026–1,846 |
| Percentage of total emissions from electric power systems in the state of Nevada[e] | | | 3.5–6.3% | 3.5–6.3% | 3.5–6.3% | 3.5–6.3% |
| Percentage of total emissions from all source categories in the state of Nevada[f] | | | 2.8–5.1% | 1.1–1.9% | –[g] | 1.9–3.4% |
| Percentage of total emissions from electric power systems in the six-state study area[e] | | | 0.74–1.3% | 0.43–0.78% | 0.36–0.65% | 0.39–0.70% |
| Percentage of total emissions from all source categories in the six-state study area[e] | | | 0.40–0.71% | 0.06–0.11% | – | 0.12–0.22% |

[a] To convert acres to $km^2$, multiply by 0.004047.

[b] It is assumed that the SEZ would eventually have development on 80% of the lands and that a range of 5 acres (0.020 $km^2$) per MW (for parabolic trough technology) to 9 acres (0.04 $km^2$) per MW (power tower, dish engine, and PV technologies) would be required.

[c] Assumed a capacity factor of 20%.

[d] Composite combustion-related emission factors for $SO_2$, $NO_x$, Hg, and $CO_2$ of 2.82, 2.42, $1.6 \times 10^{-5}$, and 1,553 lb/MWh, respectively, were used for the state of Nevada.

[e] Emission data for all air pollutants are for 2005.

[f] Emission data for $SO_2$ and $NO_x$ are for 2002, while those for $CO_2$ are for 2005.

[g] A dash indicates not estimated.

Sources: EPA (2009a,b); WRAP (2009).

### 11.1.13.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce air quality impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Limiting dust generation during construction and operations is a required programmatic design feature under the BLM Solar Energy Program. These extensive fugitive dust control measures would keep off-site PM levels as low as possible during construction.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features to address air quality impacts in the proposed

Amargosa Valley SEZ have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.1.14 Visual Resources

### 11.1.14.1 Affected Environment

The proposed Amargosa Valley SEZ, as revised, extends approximately 3.1 mi (4.8 km) east to west and approximately 7.0 mi (11.3 km) north to south. The SEZ boundaries have been revised to eliminate the area south and west of the Amargosa River floodplain and the area northeast of U.S. 95; U.S. 95 no longer passes through the northeast portion of the SEZ and instead now serves as the northeastern boundary. Areas of the SEZ that were labeled to meet Visual Resource Management (VRM) Class II-consistent management objectives in the Draft Solar PEIS also have been eliminated from the SEZ.

The boundary changes resulted in the elimination of 21,888 acres (88.6 $km^2$). In addition, 1,258 acres (5.1 $km^2$) within the SEZ boundaries have been identified as non-development areas. These areas consist of lands within the Amargosa River floodplain, which were included in the SEZ to facilitate the definition of the SEZ boundaries. As a result, the developable area within the SEZ now includes an area of 8,479 acres (34.3 $km^2$). Because of the reduction in size of the SEZ, the total acreage of the lands visible within the 25-mi (40 km) viewshed of the SEZ has decreased.

An updated Visual Resources Inventory (VRI) map for the SEZ and surrounding lands is shown in Figure 11.1.14.1-1; it provides information from the BLM 2007 VRI, which was finalized in October 2011 (BLM 2011a). As shown, the updated VRI value for the SEZ is VRI Class III, indicating moderate relative visual values. The updated inventory indicates low scenic quality for the SEZ and its immediate surroundings. Positive scenic quality attributes included moderately rated adjacent scenery. The updated inventory also indicates high sensitivity for the SEZ and its immediate surroundings, based on a moderate level of use and a high level of public interest.

The 25-mi (40-km), 650-ft (198-m) viewshed contains lands located in the Barstow Field Office, the Battle Mountain District Office, and the Southern Nevada District Office. Lands within this viewshed have the following VRI Class designations:

- Barstow Field Office
  - 3,160 acres (12.8 $km^2$) of VRI Class I areas, and
  - 14,822 acres (60.0 $km^2$) of VRI Class IV areas.

- Battle Mountain District Office
  - 3,067 acres (12.4 $km^2$) of VRI Class II areas,
  - 15,923 acres (64.4 $km^2$) of VRI Class III areas, and
  - 14,588 acres (59.0 $km^2$) of VRI Class IV areas.

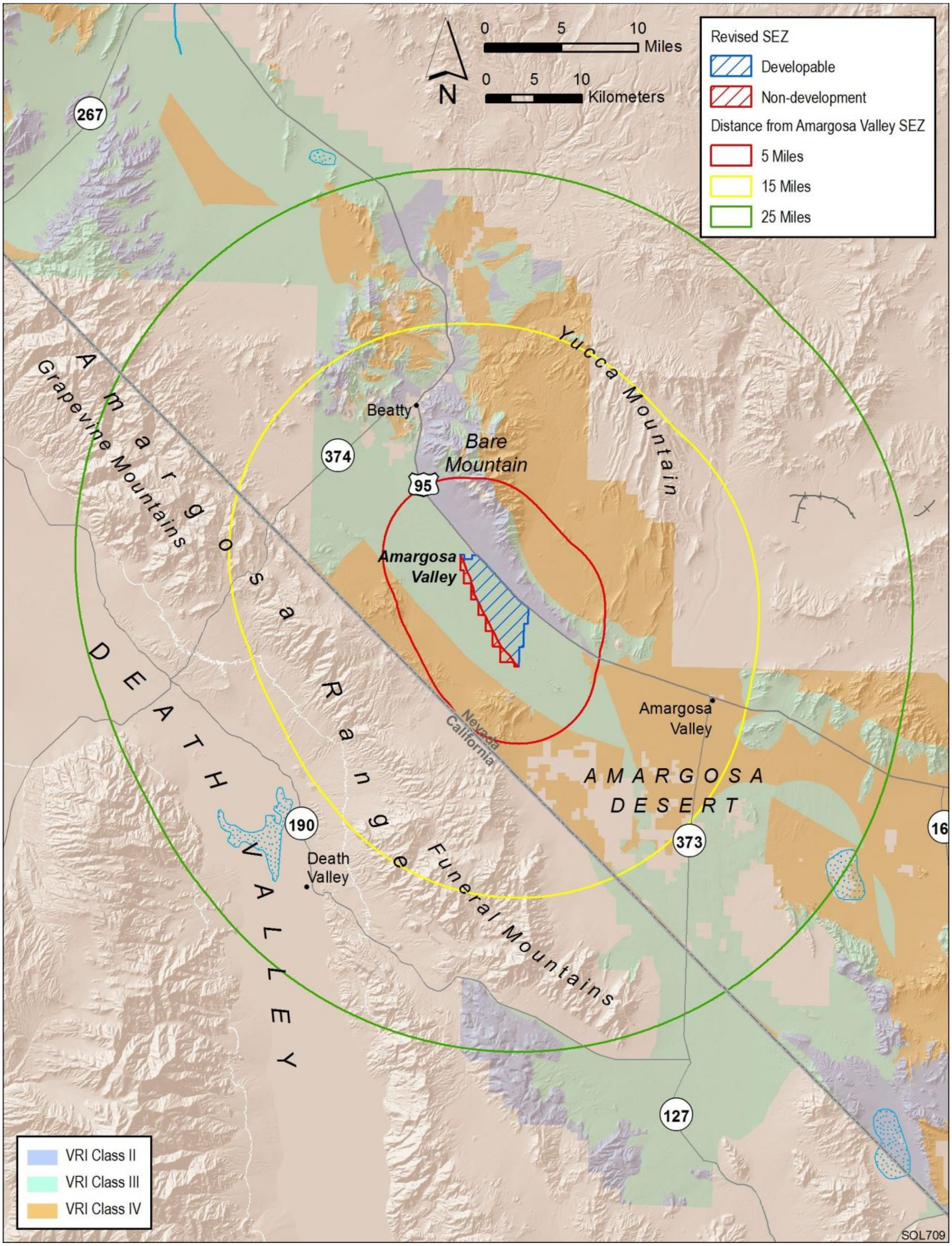


**FIGURE 11.1.14.1-1 Visual Resource Inventory Values for the Proposed Amargosa Valley SEZ as Revised**

- Southern Nevada District Office
  - 17,067 acres (69.1 km$^2$) of VRI Class II areas,
  - 108,955 acres (440.9 km$^2$) of VRI Class III areas, and
  - 133,410 acres (539.9 km$^2$) of VRI Class IV areas.

As indicated in the Draft Solar PEIS, the proposed SEZ is managed as VRM Classes III and IV. However, because of the elimination of acreage, the revised Amargosa Valley SEZ now is primarily managed as VRM Class III, with only a small portion in the southwest (near the non-developable lands) as VRM Class IV.

### 11.1.14.2 Impacts

The reduction in SEZ size would substantially decrease the total visual impacts associated with solar energy development in the SEZ. It would limit the total amount of solar facility infrastructure that would be visible and the geographic extent of the visible infrastructure.

The reduction in size of the proposed Amargosa Valley SEZ in the Supplement to the Draft Solar PEIS eliminates approximately 73% of the original SEZ. The resulting visual contrast reduction for any given point within view of the SEZ would vary greatly depending on the viewpoint's distance and direction from the SEZ. Contrast reduction generally would be greatest for viewpoints closest to the portions of the SEZ that were eliminated and especially for those that had wide-angle views of these areas. In general, contrast reductions also would be larger for elevated viewpoints relative to non-elevated viewpoints, because the reduction in area of the solar facilities would be more apparent when looking down at the SEZ than when looking across it.

#### *11.1.14.2.1 Impacts on the Proposed Amargosa Valley SEZ*

Although the reduction in size of the SEZ discussed in Section 11.1.14.2 would substantially reduce visual contrasts associated with solar development, solar development still would involve major modification of the existing character of the landscape; it likely would dominate the views from most locations within the SEZ. Additional impacts would occur as a result of the construction, operation, and decommissioning of related facilities, such as access roads and electric transmission lines. In general, strong visual contrasts from solar development still would be expected to be observed from viewing locations within the SEZ.

#### *11.1.14.2.2 Impacts on Lands Surrounding the Proposed Amargosa Valley SEZ*

For the Draft Solar PEIS, preliminary viewshed analyses were conducted to identify which lands surrounding the proposed SEZ could have views of solar facilities in at least some portion of the SEZ (see Appendixes M and N of the Draft Solar PEIS for important information on assumptions and limitations of the methods used). Four viewshed analyses were conducted, assuming four different heights representative of project elements associated with potential solar energy technologies: PV and parabolic trough arrays, 24.6 ft (7.5 m); solar dishes and power blocks for concentrating solar power (CSP) technologies, 38 ft (11.6 m); transmission towers and short solar power towers, 150 ft (45.7 m); and tall solar power towers, 650 ft (198.1 m).

These same viewsheds were recalculated in order to account for the boundary changes described in the Supplement to the Draft Solar PEIS. Figure 11.1.14.2-1 shows the combined results of the viewshed analyses for the four viewshed heights. The colored segments indicate areas with clear lines of sight to one or more areas within the SEZ and from which solar facilities within these areas of the SEZ would be expected to be visible, assuming adequate lighting and other atmospheric conditions, and the absence of screening vegetation or structures. The light brown areas are locations from which PV and parabolic trough arrays located in the SEZ could be visible. Solar dishes and power blocks for CSP technologies would be visible from the areas shaded in light brown and the additional areas shaded in light purple. Transmission towers and short solar power towers would be visible from the areas shaded light brown, light purple, and the additional areas shaded in dark purple. Power tower facilities located in the SEZ could be visible from areas shaded light brown, light purple, dark purple, and at least the upper portions of power tower receivers from the additional areas shaded in medium brown.

#### *11.1.14.2.3 Impacts on Selected Federal-, State-, and BLM-Designated Sensitive Visual Resource Areas and Other Lands and Resources*

Figure 11.1.14.2-2 shows the results of a geographical information system (GIS) analysis that overlays selected federal, state, and BLM-designated sensitive visual resource areas onto the combined tall solar power tower (650 ft [198.1 m]) and PV and parabolic trough array (24.6 ft [7.5 m]) viewsheds in order to illustrate which of these sensitive visual resource areas would have views of solar facilities within the SEZ and therefore potentially would be subject to visual impacts from those facilities. Distance zones that correspond to BLM's VRM system-specified foreground-middleground distance (5 mi [8 km]), background distance (15 mi [24.1 km]), and a 25-mi (40.2-km) distance zone are shown as well in order to indicate the effect of distance from the SEZ on impact levels, which are highly dependent on distance. A similar analysis was conducted for the Draft Solar PEIS.

The scenic resources included in the analysis were as follows:

- National Parks, National Monuments, National Recreation Areas, National Preserves, National Wildlife Refuges, National Reserves, National Conservation Areas, National Historic Sites;
- Congressionally authorized Wilderness Areas;
- Wilderness Study Areas;
- National Wild and Scenic Rivers;
- Congressionally authorized Wild and Scenic Study Rivers;

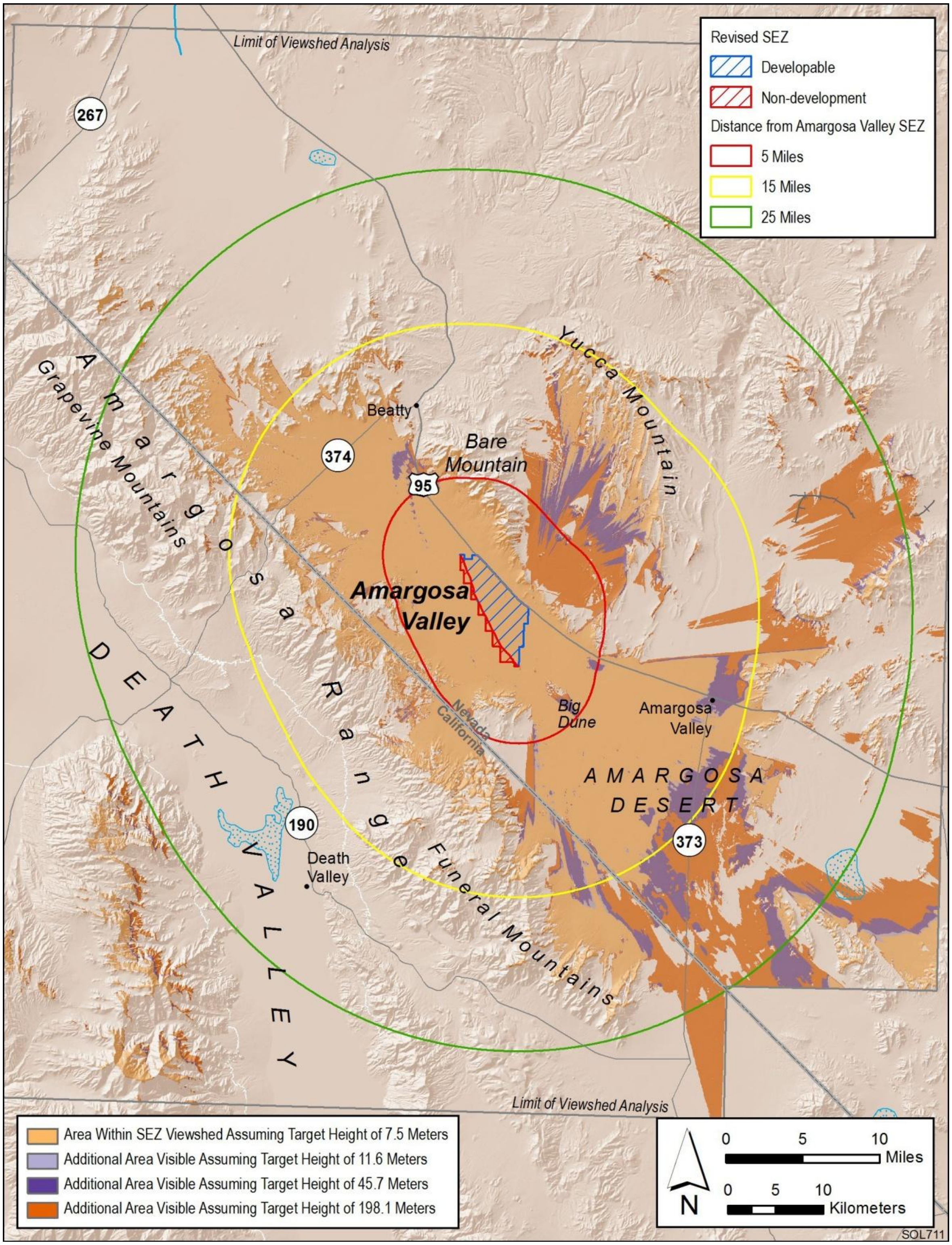


**FIGURE 11.1.14.2-1 Viewshed Analyses for the Proposed Amargosa Valley SEZ as Revised and Surrounding Lands, Assuming Viewshed Heights of 24.6 ft (7.5 m), 38 ft (11.6 m), 150 ft (45.7 m), and 650 ft (198.1 m) (shaded areas indicate lands from which solar development and/or associated structures within the SEZ could be visible)**

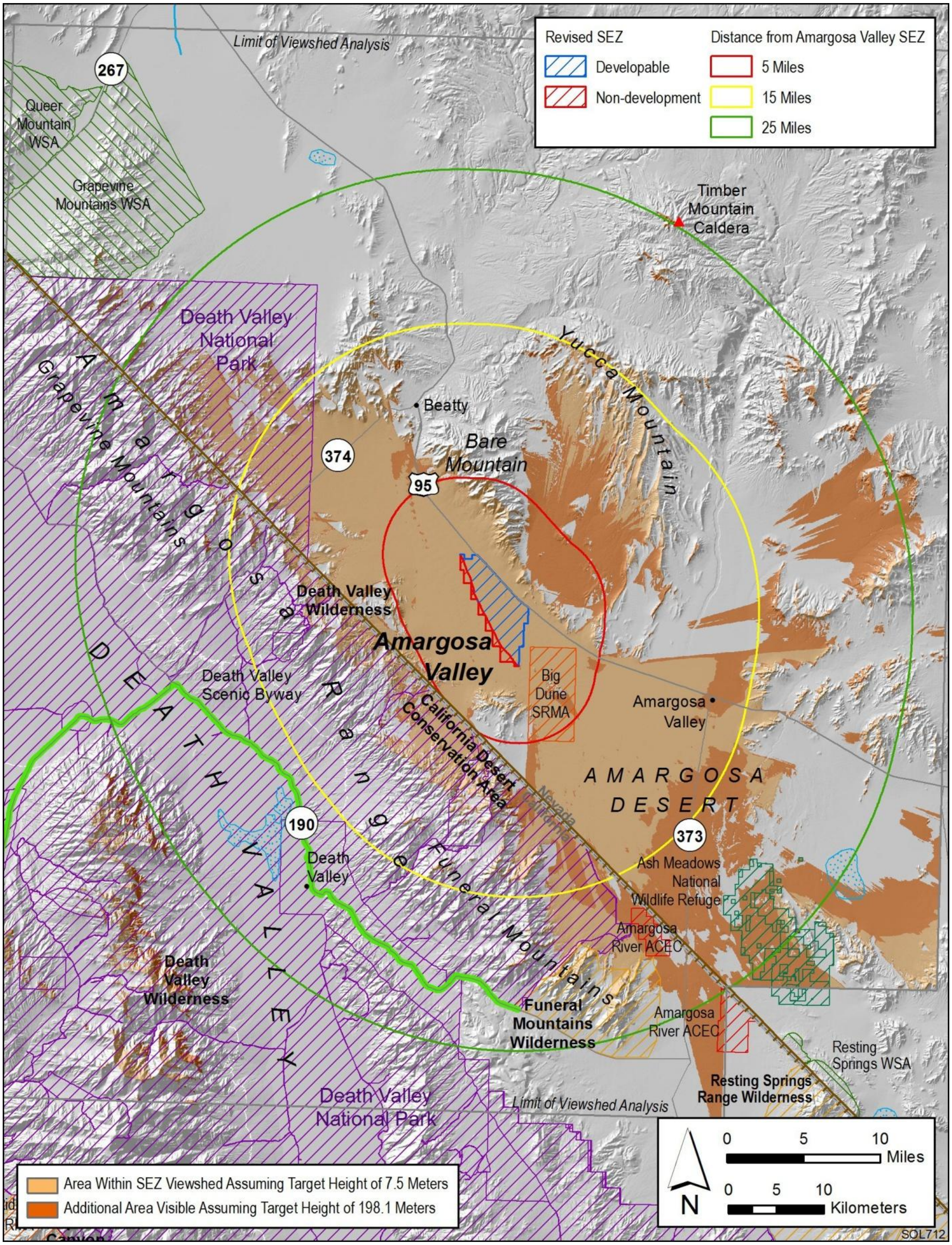


**FIGURE 11.1.14.2-2 Overlay of Selected Sensitive Visual Resource Areas onto Combined 650-ft (198.1-m) and 24.6-ft (7.5-m) Viewsheds for the Proposed Amargosa Valley SEZ as Revised**

- National Scenic Trails and National Historic Trails;

- National Historic Landmarks and National Natural Landmarks;

- All-American Roads, National Scenic Byways, State Scenic Highways, and BLM- and USFS-designated scenic highways/byways;

- BLM-designated Special Recreation Management Areas; and

- ACECs designated because of outstanding scenic qualities.

The results of the GIS analyses are summarized in Table 11.1.14.2-1. The change in size of the SEZ alters the viewshed of the SEZ, such that the visibility of the SEZ and solar facilities within the SEZ from the surrounding lands would be reduced.

**TABLE 11.1.14.2-1 Selected Potentially Affected Sensitive Visual Resources within a 25-mi (40-km) Viewshed of the Proposed Amargosa Valley SEZ as Revised, Assuming a Target Height of 650 ft (198.1 m)**

| | | Feature Area or Linear Distance[b] | | |
|---|---|---|---|---|
| | | | Visible Between | |
| Feature Type | Feature Name/ Linear Distance (Total Acreage[a]) | Visible within 5 mi | 5 and 15 mi | 15 and 25 mi |
| National Park | Death Valley (3,397,062 acres) | 0 acres (0%) | 58,953 acres (2%) | 29,504 acres (1%) |
| WAs | Death Valley (3,074,256 acres) | 0 acres (0%) | 40,892 acres (1%) | 13,900 acres (0%) |
| | Funeral Mountains (27,567 acres) | 0 acres (0%) | 0 acres (0%) | 3,675 acres (13%) |
| Wildlife Refuge | Ash Meadows (24,193 acres) | 0 acres (0%) | 0 acres (0%) | 8,896 acres (37%) |
| SRMA | Big Dune (11,572 acres) | 10,230 acres (88%) | 858 acres (7%) | 0 acres (0%) |
| ACEC | Amargosa River (27,797 acres) | 0 acres (0%) | 0 acres (0%) | 2,254 acres (8%) |
| National Conservation Area | California Desert (25,919,319 acres) | 0 acres (0%) | 44,903 acres (0%) | 31,191 acres (0%) |

[a] To convert acres to $km^2$, multiply by 0.004047.

[b] Percentage of total feature acreage or road length viewable.

With the reduction in size of the SEZ, solar energy development within the SEZ would be expected to create minimal or weak visual contrasts for viewers within three of the seven surrounding scenic resource areas and other resources listed in Table 11.1.14.2-1. Moderate or strong visual contrasts still would occur in the Death Valley NP and WA, Big Dune SRMA, and the California Desert National Conservation Area (CDNCA).

In addition to these areas, impacts on other lands and resource areas also were evaluated. These areas include U.S. 95, State Route 374, and State Route 373.

#### *11.1.14.2.4 Summary of Visual Resource Impacts for the Proposed Amargosa Valley SEZ*

The visual contrast analysis in the Draft Solar PEIS determined that because there could be multiple solar facilities within the Amargosa Valley SEZ and a range of supporting facilities required, solar development within the SEZ would make it essentially industrial in appearance and would contrast strongly with the surrounding mostly natural-appearing landscape.

The reduction in size of the SEZ would decrease the visual contrast associated with solar facilities as seen both within the SEZ and from surrounding lands in both daytime and nighttime views. The reductions in visual contrast can be summarized as follows:

- Within the Amargosa Valley SEZ: Contrasts experienced by viewers in the area south and west of the Amargosa River floodplain and the area northeast of U.S. 95 would be reduced because of the elimination of 21,888 acres (88.6 $km^2$) of land within these areas of the SEZ. A small reduction in contrasts also would occur within 1,258 acres (5.1 $km^2$) that were identified within the Amargosa River floodplain due to their designation as non-development lands. Strong contrasts, however, still would result in the remaining developable areas of the SEZ.

- Death Valley NP: A reduction in contrasts would be anticipated due to the revision of the SEZ. The SEZ, as it was originally proposed in the Draft Solar PEIS, was located within 1 mi (1.6 km) of the National Park. Viewers within the National Park would have open views of the SEZ, especially from elevated viewpoints. At the point of closest approach, Death Valley NP now is just more than 5 mi (8 km) from the southwest border of the SEZ. Because of the proximity of the National Park to the SEZ and the potential for views from elevated viewpoints, solar development within the SEZ still would cause weak to strong contrasts, depending on viewer location within the National Park.

- Death Valley WA: See above for Death Valley NP.

- Funeral Mountains WA: A reduction in contrasts would be anticipated due to the elimination of acreage within the southern portion of the SEZ. Expected contrast levels would be lowered from “weak” to “minimal to weak.”

- Ash Meadows NWR: A reduction in contrasts would be anticipated due to the revision of the SEZ; expected contrast levels would be lowered from “weak” to “minimal to weak.”

- Big Dune SRMA: A reduction in contrasts would be anticipated due to the elimination of approximately 73% of the SEZ. However, because of the proximity of the SEZ and the presence of some relatively open views, solar development within the SEZ still would cause strong contrasts. Contrast would be slightly weaker from viewpoints in the southeastern portion of the SRMA.

- Amargosa River ACEC: A reduction in contrasts would be anticipated due to the revision of the SEZ. The amount of acreage within the 25-mi (40-km) viewshed decreased by 665 acres (2.7 $km^2$); however, solar development within the SEZ still would cause minimal contrasts.

- CDNCA: A reduction in contrasts would be anticipated, especially in those areas that were located within 5 mi (8 km) of the SEZ, as it was originally proposed in the Draft Solar PEIS. The CDNCA now is located slightly more than 5 mi (8 km) from the SEZ at the point of closest approach. Solar development within the SEZ, however, still would cause weak to strong contrasts, depending on viewer location within the CDNCA.

- U.S. 95: A reduction in contrasts would be anticipated due to the elimination of acreage on the northeast side of U.S. 95. The highway now serves as the boundary of the SEZ, rather than passing through it. The strongest contrast would be seen by viewers traveling along the highway in those portions that serve as the SEZ boundary. Because of the close proximity, solar development within the SEZ still would cause strong contrasts.

- State Route 374: A reduction in contrasts would be anticipated because of the revision of the SEZ, which eliminated some of the northwest portions of the SEZ. Solar development, however, within the SEZ still would cause weak to moderate contrasts, depending on viewer location on State Route 374.

- State Route 373: A reduction in contrasts would be anticipated because of the elimination of acreage in the southeast portion of the SEZ; expected contrast levels would be lowered from “minimal to weak” to “minimal.”

#### 11.1.14.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on visual resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. While application of the programmatic design features will reduce potential visual impacts somewhat, the degree of effectiveness of these design features could be assessed only at the site- and project-specific level. Given the large scale, reflective surfaces, and strong regular geometry of utility-scale solar energy facilities and the lack of screening vegetation and landforms within the SEZ viewshed, siting the facilities away from sensitive visual resource areas and other sensitive viewing areas would be the primary means of mitigating visual impacts. The effectiveness of other visual impact mitigation measures generally would be limited.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for visual resources have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.1.15 Acoustic Environment

### 11.1.15.1 Affected Environment

The developable area of the proposed Amargosa Valley SEZ was reduced by about 73% from 31,625 acres (128.0 $km^2$) to 8,479 acres (34.3 $km^2$); the southern and western boundaries were moved inward about 1.5 mi (2.4 km) and 1.2 to 5.0 mi (1.9 to 8.0 km), respectively; and the area north of U.S. 95 was removed. These reductions increased the distances to some of the sensitive receptors at which noise was modeled for the Draft Solar PEIS. In particular, the nearest residences to the south and Death Valley NP to the southwest are now farther from the proposed SEZ boundary than was assumed in the Draft Solar PEIS. Consequently, noise levels at these receptors will be lower than those predicted in the Draft Solar PEIS.

Comments provided by the DoD on the Supplement to the Draft Solar PEIS noted that several approved, highly utilized MTRs exist in airspace directly above the SEZ. Existing noise levels at the SEZ include periodic loud routine military flight operations occurring in MTRs located directly above and proximate to the SEZ.

### 11.1.15.2 Impacts

#### *11.1.15.2.1 Construction*

Except for the area disturbed at any one time during construction, the methods and modeling assumptions have not changed from those presented in the Draft Solar PEIS. On the basis of the boundary changes and reduced size of the proposed Amargosa Valley SEZ, noise impacts for this Final Solar PEIS were remodeled assuming that 3,000 acres (12.14 $km^2$) in the southern portion of the proposed SEZ (the area closest to the nearest residences) would be disturbed at any one time. The updated noise predictions are less than those in the Draft Solar PEIS, and, except as noted below for wildlife impact in specially designated areas, the conclusions presented in the Draft Solar PEIS remain valid.

With the revised SEZ boundaries, estimated construction noise levels at the nearest residence (about 5.9 mi [9.5 km] south of the SEZ) would be about 22 dBA, which is well below a typical daytime mean rural background level of 40 dBA. In addition, an estimated 40 dBA $L_{dn}$ at this residence (i.e., no contribution from construction activities) is well below the EPA guidance of 55 dBA $L_{dn}$ for residential areas.

On the basis of comments received and recent references as applicable, this Final Solar PEIS used an approximate significance threshold of 55 dBA corresponding to the onset of adverse physiological impacts (Barber et al. 2010) to update the analysis of potential noise impacts on terrestrial wildlife in areas of special concern. Noise levels were updated for two of three specially designated areas within 5 mi (8.0 km) of the proposed Amargosa Valley SEZ. The updated distance between the revised SEZ boundaries and Death Valley NP is greater than that in the Draft Solar PEIS, and predicted noise levels at the National Park's boundary are lower (25 dBA). The distance to Big Dune ACEC is unchanged by the revised boundaries; thus the predicted noise level will be the same as in the Draft Solar PEIS (36 dBA). Both these levels are below the 55 dBA approximate significance threshold and the typical daytime mean rural background level of 40 dBA. The third specially designated area, Big Dune SRMA, which includes Big Dune ACEC, was established to provide a management framework primarily for OHV use, and noise is not likely to be a concern at the Big Dune SRMA. As concluded in the Draft Solar PEIS, construction noise in the proposed SEZ is not likely to be a significant concern for the three nearby specially designated areas. However, as discussed in Section 5.10.2 of the Draft Solar PEIS and this Final Solar PEIS, there is the potential for other effects on terrestrial wildlife (e.g., startle or masking) to occur at lower noise levels (Barber et al. 2011). Considering the approximate significance threshold of 55 dBA and the potential for impacts at lower noise levels, impacts on terrestrial wildlife from construction noise would have to be considered on a site-specific basis. However, even considering potential impacts at lower noise levels, construction noise from the SEZ would not be anticipated to affect wildlife in the nearby specially designated areas.

Construction noise and vibration impacts would be the same or less than those presented in the Draft Solar PEIS, and the conclusions of the Draft Solar PEIS remain valid. Construction would cause minimal, unavoidable, but localized, short-term noise impacts on neighboring communities, even when construction activities occur close to the nearest residence. No adverse vibration impacts are anticipated from construction activities, including pile driving for dish engines.

#### *11.1.15.2.2 Operations*

Due to boundary changes and identification of non-development areas for the proposed Amargosa Valley SEZ, noise impacts for this Final Solar PEIS were remodeled.

**Parabolic Trough and Power Tower**

If thermal energy storage (TES) were not used (12 hours of daytime operations only), the predicted noise level at the nearest residence about 5.9 mi (9.5 km) away would be well below the typical daytime mean rural background of 40 dBA and the EPA guideline level of 55 dBA $L_{dn}$ for residential areas. However, if TES were used, on a calm, clear night, typical of the proposed Amargosa Valley SEZ, strong temperature inversions could focus sound downward, and the nighttime noise level would be higher than the typical nighttime mean rural background level of 30 dBA. The 55-dBA EPA guideline would still not be exceeded. The conclusion in the Draft Solar PEIS that operating parabolic trough or power tower facilities using TES and located near the southern SEZ boundary could result in minor adverse noise impacts on the nearest residence, depending on background noise levels and meteorological conditions, remains valid.

As stated above under construction impacts, for this Final Solar PEIS, an approximate significance threshold of 55 dBA was used to evaluate potential noise impacts on terrestrial wildlife in areas of special concern. With TES, estimated daytime/nighttime noise levels from operation of a parabolic trough or power tower solar facility near the southern boundary of the proposed Amargosa Valley SEZ could produce noise levels of 29/39 dBA and 37/47 dBA at the boundaries of Death Valley NP and Big Dune ACEC, respectively. These levels are below the significance threshold; thus the conclusion in the Draft Solar PEIS that adverse impacts on wildlife in the specially designated areas are unlikely remains valid. However, as discussed in Section 5.10.2, there is the potential for other effects (e.g., startle or masking) to occur at lower noise levels (Barber et al. 2011). Because of these impacts and the potential for impacts at lower noise levels, consideration of impacts on terrestrial wildlife from construction noise would have to be conducted on a site-specific basis. For potential impacts at lower noise levels, noise from a parabolic trough or power tower facility with TES could cause minor impacts on wildlife in the nearby specially designated areas. These noise levels could be audible and affect soundscapes in Death Valley NP.

**Dish Engines**

The reduced size of the proposed Amargosa Valley SEZ would decrease the maximum potential number of 25-kW dish engines to 30,148. The estimated noise level at the nearest residence about 5.9 mi (9.5 km) away would be about 35 dBA, lower than the typical daytime mean rural background level of 40 dBA and, for 12 hours of operation, about 41 dBA $L_{dn}$, well below the EPA guideline of 55 dBA $L_{dn}$ for residential areas. The conclusion of the Draft Solar PEIS that noise from dish engines could cause minor adverse impacts on the nearest residence, depending on background noise levels and meteorological conditions, remains valid.

As stated above under construction impacts, for this Final Solar PEIS an approximate significance threshold of 55 dBA was used to evaluate potential noise impacts on terrestrial wildlife in areas of special concern. Estimated noise levels from operation of a dish engine solar facility, for which dish engines are placed all over the SEZ, could produce noise levels of 38 and 44 dBA at the boundaries of Death Valley NP and Big Dune ACEC, respectively. These levels are below the significance threshold; thus the conclusion in the Draft Solar PEIS that adverse impacts on wildlife in the specially designated areas are unlikely remains valid. However, as discussed in Section 5.10.2, there is the potential for other effects (e.g., startle or masking) to occur at lower noise levels (Barber et al. 2011). Because of these impacts and the potential for impacts at lower noise levels, impacts on terrestrial wildlife from construction noise would have to be considered on a site-specific basis. For potential impacts at lower noise levels, noise from a dish engine facility could cause minor impacts on wildlife in the nearby specially designated areas. These noise levels could be audible and affect soundscapes in Death Valley NP.

Changes in the boundaries of the proposed Amargosa Valley SEZ would not affect the discussions of vibration, transformer and switchyard noise, and transmission line corona discharge presented in the Draft Solar PEIS. Noise impacts from these sources would be minimal to negligible.

##### *11.1.15.2.3 Decommissioning and Reclamation*

The discussion in the Draft Solar PEIS remains valid. Decommissioning and reclamation activities would be of short duration, and their potential noise impacts would be minor and temporary. Potential noise and vibration impacts on surrounding communities would be correspondingly less than those for construction activities.

#### 11.1.15.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce noise impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some protection from noise impacts.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes in the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for noise impacts in the proposed Amargosa Valley SEZ have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.1.16 Paleontological Resources

#### 11.1.16.1 Affected Environment

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- The residual deposits located on the southern edge and southwest corner of the SEZ are no longer in the SEZ.

- The BLM Regional Paleontologist may have additional information regarding the paleontological potential of the SEZ and be able to update the temporary assignment of Potential Fossil Yield Classification (PFYC) Class 2 as used in the Draft Solar PEIS.

#### 11.1.16.2 Impacts

The assessment provided in the Draft Solar PEIS remains valid. Few, if any, impacts on significant paleontological resources are likely to occur in the proposed Amargosa Valley SEZ. However, a more detailed look at the geological deposits of the SEZ is needed to determine whether a paleontological survey is warranted.

#### 11.1.16.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on paleontological resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Impacts would be minimized through the implementation of required programmatic design features, including a stop-work stipulation in the event that paleontological resources are encountered during construction, as described in Section A.2.2 of Appendix A.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses based on changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for paleontological resources have been identified. If the geologic deposits in the proposed Amargosa Valley SEZ are determined to be thick alluvial deposits as described in Section 11.1.16.1 of the Draft Solar PEIS and are classified as PFYC Class 2, mitigation of paleontological resources within the SEZ is not likely to be necessary. The need for and nature of any SEZ-specific design features for the remaining portion of the SEZ would depend on the results of future paleontological investigations. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

As additional information on paleontological resources (e.g., from regional paleontologists or from new surveys) becomes available, the BLM will post the data to the project Web site (http://solareis.anl.gov) for use by applicants, the BLM, and other stakeholders.

### 11.1.17 Cultural Resources

#### 11.1.17.1 Affected Environment

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- The percentage of area that has been surveyed (142 acres [0.6 $km^2$]) in the proposed Amargosa Valley SEZ has been reduced from 3% to 1.6%.

- The number of archaeological sites located in the SEZ has been reduced from four to one. The one remaining site, a railroad siding, has been determined to be not eligible for listing in the *National Register of Historic Places* (NRHP).

- The distance from the SEZ boundary to the Keane Wonder Mine has increased from 8 mi (13 km) to 12 mi (19 km).

- The distance from the SEZ boundary to Death Valley NP has been increased from 1 mi (1.6 km) to 5 mi (8 km).

- A tribally approved ethnographic study of the proposed Amargosa Valley SEZ study area was conducted (SWCA and University of Arizona 2011), and a summary of that study was presented in the Supplement to the Draft Solar PEIS. Several areas of flaked stone were noted, and a number of new cultural landscapes, important water sources, geological features, and traditional plants and animals were identified. (See Section 11.1.18 for a description of the latter.) The completed ethnographic study is available in its entirety on the Solar PEIS Web site (http://solareis.anl.gov).

- Big Dune and Eagle Mountain are important geologic features that figure into the traditional stories and songs of the Pahrump Paiute and Timbisha Shoshone Tribes.

- For the Southern Paiute, the Salt Song Trail and associated ceremonial areas pass through or are in the vicinity of the SEZ.

- The Amargosa River is one of the most culturally important features in or near the proposed Amargosa Valley SEZ, and Black Mountain, north of the SEZ, is the source of the river and a powerful ceremonial volcanic mountain.

- Naturally shaped volcanic stones with circular depressions were identified by Tribal members on the valley floor. These stones are believed to have once been used as prayer shrines for individuals travelling through the area.

- Tribal members believe that the prehistoric artifacts in the SEZ were left there intentionally as part of prayer rituals and should be left alone.

- Additional information may be available to characterize the area surrounding the proposed SEZ in the future (after the Final Solar PEIS is completed), as follows:
  - Results of a Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ, (2) trail networks through

existing ethnographic reports, and (3) overall cultural sensitivity of the landscape.

- Results of a Class II stratified random sample survey of 424 acres ($1.7\ km^2$) or roughly 5% of the SEZ. The Class II survey is being conducted by the BLM to meet its ongoing Section 110 responsibilities under the National Historic Preservation Act (NHPA). The objectives of the Class II surveys currently under contract are to reliably predict the density, diversity, and distribution of archaeological sites within each SEZ in Arizona, California, and Nevada and to create sensitivity zones based on projected site density, complexity, likely presence of human burials, and/or other tribal concerns. The BLM will continue to request funding to support additional Class II sample inventories in the SEZ areas. Areas of interest, such as dune areas and along washes, as determined through a Class I review, and, if appropriate, some subsurface testing of dune and/or colluvium areas should be considered in sampling strategies of future surveys.
- Continuation of government-to-government consultation as described in Section 2.4.3 of the Supplement to the Draft Solar PEIS and Instruction Memorandum (IM) 2012-032 (BLM 2011b), including follow-up to recent ethnographic studies covering some SEZs in Nevada and Utah with tribes not included in the original studies to determine whether those tribes have similar concerns.

#### 11.1.17.2 Impacts

As stated in the Draft Solar PEIS, direct impacts on significant cultural resources could occur in the proposed Amargosa Valley SEZ; however, further investigation is needed. The following updates are based on the revised boundaries of the SEZ:

- One known non-NRHP eligible site would potentially be affected within the reduced footprint of the SEZ, as well as the flaked stone sites identified by Tribal members.

- Impacts on the Salt Song and Southern Fox Trails are possible.

- Volcanic stone prayer shrines on the valley floor could be affected by solar energy development.

#### 11.1.17.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on cultural resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Programmatic design features assume that the necessary surveys, evaluations, and consultations will occur.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses based on changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for cultural resources have been identified. SEZ-specific design features would be determined in consultation with the Nevada State Historic Preservation Office (SHPO) and affected tribes and would depend on the results of future investigations. Information in the ethnographic reports would suggest that impacts on the Amargosa River, the Salt Song and Southern Fox Trails, and culturally sensitive plant and animal species would need to be avoided, minimized, or otherwise mitigated if solar energy development were to be initiated in the proposed Amargosa Valley SEZ. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.1.18 Native American Concerns

### 11.1.18.1 Affected Environment

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- A tribally approved ethnographic study of the proposed Amargosa Valley SEZ study area was conducted (SWCA and University of Arizona 2011), and a summary of that study was presented in the Supplement to the Draft Solar PEIS. Several areas of flaked stone were noted, and a number of new cultural landscapes, important water sources, geological features, and traditional plants and animals were identified. The completed ethnographic study is available in its entirety on the Solar PEIS Web site (http://solareis.anl.gov).

- The tribal representatives from both the Pahrump Paiute Tribe and the Timbisha Shoshone Tribe believe that all the cultural resources and landscapes within the Amargosa SEZ are important in helping both tribes to understand their past, present, and future.

- The Paiute are concerned with the effects on their cultural and spiritual lifeways of harnessing and distributing the sun’s energy.

- The tribal representatives of both the Pahrump Paiute Tribe and the Timbisha Shoshone Tribe believe that the Amargosa Valley is a sacred space that should be managed as a spiritual cultural landscape and would like to see the areas significant to each tribe (e.g., Big Dune, Eagle Mountain, and Mount Charleston) nominated as traditional cultural properties.

- Big Dune has been identified by both tribes as an important landscape feature, a geologic anomaly known as a “singing dune.” To the Paiute, it acts as a geographic marker to travelers and as a boundary and guide for spirits travelling to the afterlife along the Salt Song Trail.

- Eagle Mountain, located southeast of the SEZ, is important in both tribes' spiritual beliefs. It is the origin place of the Western Shoshone and a stop along the Salt Song Trail for the Southern Paiute.

- Mount Charleston, located southeast of the proposed SEZ in the Spring Mountains, has been identified as a creation place for the Southern Paiute.

- The Amargosa River and its origin point, Black Mountain, have been identified by tribal representatives of both groups as extremely important features. The mountain possesses *Puha* (power). As the river flows from the mountain, it carries *Puha* over the landscape, connecting other landscapes, elements, and people. Black Mountain is linked to ceremonial pilgrimages by both Shoshone and Paiute medicine people. In order to get to Black Mountain, a system of trails was followed, passing important ritual areas. In addition, Black Mountain contains a series of spiritual trails traveled by supernatural beings.

- The proposed Amargosa Valley SEZ is located on the path of the annual Shoshone spiritual run, *Mavaa Mia.* During these runs, the Shoshone communicate with the landscape, and it is important that they have unobstructed views to do so.

- Geological features identified by tribal representatives as possessing importance in stories, songs, ceremonies, and Native American lifeways include Devils Hole, Fortymile Canyon, Bare Mountain, Spring Mountains, and Ash Meadows.

- Two "Regions of Refuge" were identified during the ethnographic study: the Black Mountain area and the Spring Mountains. As Europeans encroached on Shoshone and Paiute traditional lands, the tribes retreated to these resource-rich areas.

- Both tribes have identified a number of historical events that occurred in the valley that contribute to the history of their tribes. These include the disruption of irrigation agriculture during European contact and the further disruption of lifeways from the California Gold Rush and the influx of "Forty-niners," other mining activities, the establishment of mining and ranching communities, and the development of railroads and highways. Native Americans continued to live in the area surrounding the Amargosa Valley during these activities and eventually assimilated into European communities, working in mining camps and on the railroad.

- The Pahrump Paiute representatives maintain that all geological features, artifacts, and archaeological sites have been purposely placed in their present locations and purposely revealed for present and future generations.

- The following traditional plants have been identified in addition to those listed in Table 11.1.18.1-2 of the Draft Solar PEIS: big sagebrush (*Artemisia tridentate*), blackbrush (*Coleogyne ramosissima*), brittlebush (*Encelia farinose*), desert prince's plume/Indian spinach (*Stanleya pinnata*), desert saltbush (*Atriplex polycarpa*), desert trumpet (*Eriogonum inflatum*), spiny chorizanthe (*Chorizanthe rigida*), shadscale (*Atriplex confertifolia*), and white bursage (*Ambrosia dumosa*).

- The following traditional animals have been identified in addition to those listed in Table 11.1.18.1-3 of the Draft Solar PEIS: jackrabbit (*Lepus* sp.), mountain lion (*Puma concolor*), American kestral (*Falco sparverius*), horned lark (*Eremophilia alpestris*), killdeer (*Charadrius vociferous*), loggerhead strike (*Lanius ludovicianus*), red-tailed hawk (*Buteo jamaicensis*), rock wren (*Salpinctes obsoletus*), Say's pheobe (*Sayornis saya*), turkey vulture (*Cathartes aura*), and western kingbird (*Tyrannus verticalis*).

### 11.1.18.2 Impacts

The description of potential concerns provided in the Draft Solar PEIS remains valid. During past project-related consultation, the Western Shoshone, Southern Paiute, and Owens Valley Paiute have expressed concerns over project impacts on a variety of resources. While no comments specific to the Amargosa Valley SEZ have been received from Native American tribes to date, the Big Pine Valley Tribe of the Owens Valley has commented on the scope of this PEIS. The tribe recommends that the BLM preserve undisturbed lands intact and that recently disturbed lands, such as abandoned farm fields, railyards, mines, and airfields, be given primary consideration for solar energy development. Potential impacts on existing water supplies were also a primary concern (Moose 2009). The construction of utility-scale solar energy facilities within the proposed SEZ would result in the destruction of some plants important to Native Americans and the habitat of some traditionally important animals.

In addition to the impacts discussed in the Draft Solar PEIS, the ethnographic study conducted for the proposed Amargosa Valley SEZ identified the following impacts:

- Development within the proposed Amargosa Valley SEZ could result in visual impacts on Big Dune, Eagle Mountain, Black Mountain, Devils Hole, Fortymile Canyon, Bare Mountain, the Spring Mountains, Ash Meadows, and other culturally important and prominent geological features.

- Development within the proposed Amargosa Valley SEZ will have a direct impact on *Mavaa Mia*, the annual Shoshone spiritual run.

- Development within the proposed Amargosa Valley SEZ may affect the spiritual connection that both tribes have to water, as the disturbance of the Amargosa River may cause a disturbance in the *Puha* that flows through it. Both tribes are concerned that energy development within the area will greatly reduce the amount of water that is available to the Tribe and to plants and animals in the valley.

- Development of a project area within the SEZ will directly affect culturally important plant and animal resources, as it will likely require the grading of the project area and removal of vegetation.

- OHV use and nonvehicular recreational activities, such as hiking, and vehicle traffic, have been identified by the tribal representatives as current impacts on cultural resources, cultural landscapes, traditionally important plants and animals, and water sources (SWCA and University of Arizona 2011).

#### 11.1.18.3 SEZ-Specific Design Features and Design Feature Effectiveness

Tribal representatives believe that solar energy development within the Amargosa Valley SEZ will adversely affect identified and unidentified archaeological resources, water sources, culturally important geological features, naturally occurring prayer rocks, and traditional plant, mineral, and animal resources (SWCA and University of Arizona 2011). Required programmatic design features that would reduce impacts on Native American concerns are described in Appendix A of this Final Solar PEIS. For example, impacts would be minimized through the avoidance of sacred sites, water sources, and tribally important plant and animal species. Programmatic design features require that the necessary surveys, evaluations, and consultations would occur. The tribes would be notified regarding the results of archaeological surveys, and they would be contacted immediately upon any discovery of Native American human remains and associated cultural items.

On the basis of the impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes in SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features to address Native American concerns have been identified. The need for and nature of SEZ-specific design features would be determined during government-to-government consultation with the affected tribes as part of the process of preparing parcels for competitive offer and subsequent project-specific analysis. Potential culturally significant sites and landscapes in the vicinity of the SEZ associated with the Fortymile Canyon, Bare Mountain, Eagle Mountain, Big Dune, Amargosa River, Ash Meadows, and Salt Song and Southern Fox Trails, as well as rock art sites, clay, salt, and pigment sources, water resources, and plant and animal resources, should be considered and discussed during consultation.

### 11.1.19 Socioeconomics

#### 11.1.19.1 Affected Environment

Although the boundaries of the Amargosa Valley SEZ have been changed, the socioeconomic region of influence (ROI), the area in which site employees would live and spend their wages and salaries and into which any in-migration would occur, includes the same counties and communities as described in the Draft Solar PEIS, meaning that no changes in the affected environment information given in the Draft Solar PEIS are required.

### 11.1.19.2 Impacts

Socioeconomic resources in the ROI around the SEZ could be affected by solar energy development through the creation of direct and indirect employment and income, the generation of direct sales and income taxes, SEZ acreage rental and capacity payments to BLM, the in-migration of solar facility workers and their families, and impacts on local housing markets and on local community service employment. The impact assessment provided in the Draft Solar PEIS remains valid, with the following updates.

#### *11.1.19.2.1 Solar Trough*

**Construction**

Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of solar trough technologies would be up to 2,922 jobs (Table 11.1.19.2-1). Construction activities would constitute 0.2% of total ROI employment. A solar facility would also produce $180.6 million in income; direct sales taxes would be $1.2 million.

Given the scale of construction activities and the low likelihood that the entire construction workforce in the required occupational categories would be available within the ROI, construction of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with up to 743 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility construction on the number of vacant rental housing units would not be expected to be large, with up to 257 rental units expected to be occupied in the ROI. This occupancy rate would represent 0.5% of the vacant rental units expected to be available in the ROI.

In addition to the potential impact on housing markets, in-migration would affect community service employment (education, health, and public safety). An increase in such employment would be required to meet existing levels of service in the ROI. Accordingly, up to six new teachers, two physicians, and two public safety employees (career firefighters and uniformed police officers) would be required in the ROI. These increases would represent less than 0.1% of total ROI employment expected in these occupations.

**Operations**

Total operations employment impacts in the ROI (including direct and indirect impacts) of a full build-out of the SEZ using solar trough technologies would be up to 444 jobs (Table 11.1.19.2-1). Such a solar facility would also produce $16.8 million in income; direct sales taxes would be $0.2 million. On the basis of fees established by the BLM (BLM 2010), acreage–related fees would be $0.5 million, and solar generating capacity fees, at least $8.9 million.

Operation of a solar facility likely would require some in-migration of workers and their families from outside the ROI, with up to 38 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility operation on the number of vacant owner-occupied housing units would not be expected to be large, with up to 23 owner-occupied units expected to be occupied in the ROI.

No new community service employment would be required to meet existing levels of service in the ROI.

### *11.1.19.2.2 Power Tower*

**Construction**

Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of power tower technologies would be up to 1,164 jobs (Table 11.1.19.2-2). Construction activities would constitute 0.1% of total ROI employment. Such a solar facility would also produce $71.9 million in income; direct sales taxes would be $0.5 million.

Given the scale of construction activities and the low likelihood that the entire construction workforce in the required occupational categories would be available in the ROI, construction of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with up to 296 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility construction on the number of vacant rental housing units would not be expected to be large, with up to 102 rental units expected to be occupied in the ROI. This occupancy rate would represent 0.2% of the vacant rental units expected to be available in the ROI.

In addition to the potential impact on housing markets, in-migration would affect community service (education, health, and public safety) employment. An increase in such employment would be required to meet existing levels of service in the ROI. Accordingly, up to three new teachers, one physician, and one public safety employee would be required in the ROI.

**TABLE 11.1.19.2-1 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Amargosa Valley SEZ as Revised with Trough Facilities**

| Parameter | Maximum Annual Construction Impacts[a] | Annual Operations Impacts[b] |
|---|---|---|
| Employment (no.) | | |
| Direct | 1,744 | 296 |
| Total | 2,922 | 444 |
| Income[c] | | |
| Total | 180.6 | 16.8 |
| Direct state taxes[c,d] | | |
| Sales | 1.2 | 0.2 |
| BLM payments[c] | | |
| Acreage-related fee | NA[e] | 0.5 |
| Capacity fee[f] | NA | 8.9 |
| In-migrants (no.) | 743 | 38 |
| Vacant housing[g] (no.) | 257 | 23 |
| Local community service employment | | |
| Teachers (no.) | 6 | 0 |
| Physicians (no.) | 2 | 0 |
| Public safety (no.) | 2 | 0 |

[a] Construction impacts were based on the development at the site in a single year; it was assumed that several facilities with a combined capacity of up to 600 MW (corresponding to 3,000 acres [12 $km^2$] of land disturbance) could be built.

[b] Operations impacts were based on full build-out of the site, producing a total output of 1,357 MW.

[c] Values are reported in $ million 2008.

[d] There is currently no individual income tax in Nevada.

[e] NA = not applicable.

[f] The BLM annual capacity payment was based on a fee of $6,570/MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010), assuming a solar facility with no storage capability, and full build-out of the site. Projects with three or more hours of storage would generate higher payments, based on a fee of $7,884/MW.

[g] Construction activities would affect vacant rental housing; operations activities would affect vacant owner-occupied housing.

**TABLE 11.1.19.2-2 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Amargosa Valley SEZ as Revised with Power Tower Facilities**

| Parameter | Maximum Annual Construction Impacts[a] | Annual Operations Impacts[b] |
|---|---|---|
| Employment (no.) | | |
| Direct | 695 | 153 |
| Total | 1,164 | 202 |
| Income[c] | | |
| Total | 71.9 | 7.0 |
| Direct state taxes[c] | | |
| Sales | 0.5 | <0.1 |
| BLM payments[c,d] | | |
| Acreage-related fee | NA[e] | 0.5 |
| Capacity fee[f] | NA | 5.0 |
| In-migrants (no.) | 296 | 19 |
| Vacant housing[g] (no.) | 102 | 12 |
| Local community service employment | | |
| Teachers (no.) | 3 | 0 |
| Physicians (no.) | 1 | 0 |
| Public safety (no.) | 1 | 0 |

a Construction impacts were based on the development at the site in a single year; it was assumed that several facilities with a combined capacity of up to 333 MW (corresponding to 3,000 acres [12 km$^2$] of land disturbance) could be built.

b Operations impacts were based on full build-out of the site, producing a total output of 754 MW.

c Values are reported in $ million 2008.

d There is currently no individual income tax in Nevada.

e NA = not applicable.

f The BLM annual capacity payment was based on a fee of $6,570/MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010), assuming a solar facility with no storage capability, and full build-out of the site. Projects with three or more hours of storage would generate higher payments, based on a fee of $7,884/MW.

g Construction activities would affect vacant rental housing; operations activities would affect vacant owner-occupied housing.

These increases would represent less than 0.1% of total ROI employment expected in these occupations.

**Operations**

Total operations employment impacts in the ROI (including direct and indirect impacts) of a full build-out of the SEZ using power tower technologies would be 202 jobs (Table 11.1.19.2-2). Such a solar facility would also produce $7.0 million in income; direct sales taxes would be less than $0.1 million. On the basis of fees established by the BLM (BLM 2010), acreage–related fees would be $0.5 million, and solar generating capacity fees, at least $5.0 million.

Operation of a solar facility likely would require some in-migration of workers and their families from outside the ROI, with 19 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility operation on the number of vacant owner-occupied housing units would not be expected to be large, with 12 owner-occupied units expected to be required in the ROI.

No new community service employment would be required to meet existing levels of service in the ROI.

### *11.1.19.2.3 Dish Engine*

**Construction**

Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of dish engine technologies would be up to 473 jobs (Table 11.1.19.2-3). Construction activities would constitute less than 0.1% of total ROI employment. Such a solar facility would also produce $29.2 million in income; direct sales taxes would be $0.2 million.

Given the scale of construction activities and the low likelihood that the entire construction workforce in the required occupational categories would be available in the ROI, construction of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with up to 120 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility construction on the number of vacant rental housing units would not be expected to be large, with up to 42 rental units expected to be occupied in the ROI. This occupancy rate would represent 0.1 % of the vacant rental units expected to be available in the ROI.

**TABLE 11.1.19.2-3 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Amargosa Valley SEZ as Revised with Dish Engine Facilities**

| Parameter | Maximum Annual Construction Impacts[a] | Annual Operations Impacts[b] |
|---|---|---|
| Employment (no.) | | |
| Direct | 282 | 148 |
| Total | 473 | 196 |
| Income[c] | | |
| Total | 29.2 | 6.8 |
| Direct state taxes[c] | | |
| Sales | 0.2 | <0.1 |
| BLM payments[c,d] | | |
| Acreage-related fee | NA[e] | 0.5 |
| Capacity fee[f] | NA | 5.0 |
| In-migrants (no.) | 120 | 19 |
| Vacant housing[g] (no.) | 42 | 12 |
| Local community service employment | | |
| Teachers (no.) | 1 | 0 |
| Physicians (no.) | 0 | 0 |
| Public safety (no.) | 0 | 0 |

[a] Construction impacts were based on the development at the site in a single year; it was assumed that several facilities with a combined capacity of up to 333 MW (corresponding to 3,000 acres [12 $km^2$] of land disturbance) could be built.

[b] Operations impacts were based on full build-out of the site, producing a total output of 754 MW.

[c] Values are reported in $ million 2008.

[d] There is currently no individual income tax in Nevada.

[e] NA = not applicable.

[f] The BLM annual capacity payment was based on a fee of $6,570/MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010), assuming a solar facility with no storage capability, and full build-out of the site. Projects with three or more hours of storage would generate higher payments, based on a fee of $7,884/MW.

[g] Construction activities would affect vacant rental housing; operations activities would affect vacant owner-occupied housing.

In addition to the potential impact on housing markets, in-migration would affect community service (education, health, and public safety) employment. An increase in such employment would be required to meet existing levels of service in the ROI. Accordingly, up to one new teacher would be required in the ROI. These increases would represent less than 0.1% of total ROI employment expected in these occupations.

**Operations**

Total operations employment impacts in the ROI (including direct and indirect impacts) of a full build-out of the SEZ using dish engine technologies would be 196 jobs (Table 11.1.19.2-3). Such a solar facility would also produce $6.8 million in income; direct sales taxes would be less than $0.1 million. On the basis of fees established by the BLM (BLM 2010), acreage–related fees would be $0.5 million, and solar generating capacity fees, at least $5.0 million.

Operation of a solar facility likely would require some in-migration of workers and their families from outside the ROI, with up to 19 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility operation on the number of vacant owner-occupied housing units would not be expected to be large, with up to 12 owner-occupied units expected to be required in the ROI.

No new community service employment would be required to meet existing levels of service in the ROI.

***11.1.19.2.4 Photovoltaic***

**Construction**

Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of PV technologies would be up to 221 jobs (Table 11.1.19.2-4). Construction activities would constitute less than 0.1% of total ROI employment. Such a solar development would also produce $13.7 million in income; direct sales taxes would be $0.1 million.

Given the scale of construction activities and the low likelihood that the entire construction workforce in the required occupational categories would be available in the ROI, construction of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with up to 56 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility construction on the number of vacant rental housing units would not be expected to be large, with 19 rental units expected to be occupied in

**TABLE 11.1.19.2-4 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Amargosa Valley SEZ as Revised with PV Facilities**

| Parameter | Maximum Annual Construction Impacts[a] | Annual Operations Impacts[b] |
|---|---|---|
| Employment (no.) | | |
| Direct | 132 | 15 |
| Total | 221 | 20 |
| Income[c] | | |
| Total | 13.7 | 0.7 |
| Direct state taxes[c] | | |
| Sales | 0.1 | <0.1 |
| BLM payments[c,d] | | |
| Acreage-related fee | NA[e] | 0.5 |
| Capacity fee[f] | NA | 4.0 |
| In-migrants (no.) | 56 | 2 |
| Vacant housing[g] (no.) | 19 | 1 |
| Local community service employment | | |
| Teachers (no.) | 0 | 0 |
| Physicians (no.) | 0 | 0 |
| Public safety (no.) | 0 | 0 |

[a] Construction impacts were based on the development at the site in a single year; it was assumed that several facilities with a combined capacity of up to 333 MW (corresponding to 3,000 acres [12 km$^2$] of land disturbance) could be built.

[b] Operations impacts were based on full build-out of the site, producing a total output of 754 MW.

[c] Values are reported in $ million 2008.

[d] There is currently no individual income tax in Nevada.

[e] NA = data not applicable.

[f] The BLM annual capacity payment was based on a fee of $5,256/MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010), assuming full build-out of the site.

[g] Construction activities would affect vacant rental housing; operations activities would affect owner-occupied housing.

the ROI. This occupancy rate would represent less than 0.1% of the vacant rental units expected to be available in the ROI.

No new community service employment would be required to meet existing levels of service in the ROI.

**Operations**

Total operations employment impacts in the ROI (including direct and indirect impacts) of a full build-out of the SEZ using PV technologies would be 20 jobs (Table 11.1.19.2-4). Such a solar facility would also produce $0.7 million in income; direct sales taxes would be less than $0.1 million. On the basis of fees established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010), acreage–related fees would be $0.5 million, and solar generating capacity fees, at least $4.0 million.

Operation of a solar facility likely would require some in-migration of workers and their families from outside the ROI, with two persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility operation on the number of vacant owner-occupied housing units would not be expected to be large, with one owner-occupied unit expected to be required in the ROI.

No new community service employment would be required to meet existing levels of service in the ROI.

### 11.1.19.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce socioeconomic impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will reduce the potential for socioeconomic impacts during all project phases.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features to address socioeconomic impacts in the proposed Amargosa Valley SEZ have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.1.20 Environmental Justice

### 11.1.20.1 Affected Environment

The data presented in the Draft Solar PEIS have not substantially changed due to the change in boundaries of the proposed Amargosa Valley SEZ. There are no minority or low-income populations in the Nevada or California portions of the 50-mi (80-km) radius of the SEZ taken as a whole. However, because of the changes to the SEZ boundaries, revised data on minority and low-income populations within a 50-mi (80-km) radius of the SEZ are presented in Table 11.1.20.1-1 and are discussed below.

The data in Table 11.1.20.1-1 show the minority and low-income composition of the total population located in the proposed Amargosa Valley SEZ based on 2000 Census data

**TABLE 11.1.20.1-1 Minority and Low-Income Populations within the 50-mi (80-km) Radius Surrounding the Proposed Amargosa Valley SEZ as Revised**

| Parameter | California | Nevada |
|---|---|---|
| Total population | 2,034 | 31,656 |
| White, non-Hispanic | 1,570 | 26,283 |
| Hispanic or Latino | 245 | 2,751 |
| Non-Hispanic or Latino minorities | 219 | 2,622 |
| One race | 162 | 1,858 |
| Black or African American | 2 | 1,001 |
| American Indian or Alaskan Native | 132 | 406 |
| Asian | 17 | 280 |
| Native Hawaiian or Other Pacific Islander | 9 | 95 |
| Some other race | 2 | 76 |
| Two or more races | 57 | 764 |
| Total minority | 464 | 5,373 |
| Low-income | 212 | 3,293 |
| Percentage minority | 22.8 | 17.0 |
| State percentage minority | 53.3 | 34.8 |
| Percentage low-income | 10.5 | 11.2 |
| State percentage low-income | 14.2 | 10.5 |

Source: U.S Bureau of the Census (2009a,b).

(U.S. Bureau of the Census 2009a,b) and Council on Environmental Quality (CEQ) guidelines (CEQ 1997). Individuals identifying themselves as Hispanic or Latino are included in the table as a separate entry. However, because Hispanics can be of any race, this number also includes individuals identifying themselves as being part of one or more of the population groups listed in the table.

A large number of minority and low-income individuals are located in the 50-mi (80-km) area around the boundary of the SEZ. Within the 50-mi (80-km) radius in California, 22.8% of the population is classified as minority, while 10.5% is classified as low-income. However, the number of minority individuals does not exceed 50% of the total population in the area, and the number of minority individuals does not exceed the state average by 20 percentage points or more; thus, in aggregate, there is no minority population in the SEZ area based on 2000 Census data and CEQ guidelines. The number of low-income individuals does not exceed the state average by 20 percentage points or more and does not exceed 50% of the total population in the area; thus, in aggregate, there are no low-income populations in the SEZ.

In the Nevada portion of the 50-mi (80-km) radius, 17.0% of the population is classified as minority, while 11.2% is classified as low-income. The number of minority individuals does not exceed 50% of the total population in the area and the number of minority individuals does not exceed the state average by 20 percentage points or more; thus, in aggregate, there is no minority population in the SEZ area based on 2000 Census data and CEQ guidelines. The number of low-income individuals does not exceed the state average by 20 percentage points or more and does not exceed 50% of the total population in the area; thus, in aggregate, there are no low-income populations in the SEZ.

#### 11.1.20.2 Impacts

Environmental justice concerns common to all utility-scale solar energy facilities are described in detail in Section 5.18 of the Draft Solar PEIS. The potentially relevant environmental impacts associated with solar facilities within the proposed Amargosa Valley SEZ include noise and dust during construction; noise and electromagnetic field (EMF) effects associated with operations; visual impacts of solar generation and auxiliary facilities, including transmission lines; access to land used for economic, cultural, or religious purposes; and effects on property values as areas of concern that might potentially affect minority and low-income populations.

Potential impacts on low-income and minority populations could be incurred as a result of the construction and operation of solar facilities involving each of the four technologies. Impacts are likely to be small, and there are no minority populations defined by CEQ guidelines (Section 11.1.20.1-1) within the 50-mi (80-km) radius around the boundary of the SEZ; this means that any adverse impacts of solar projects would not disproportionately affect minority populations. Because there are also no low-income populations within the 50-mi (80-km) radius, there would be no impacts on low-income populations.

#### 11.1.20.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce potential environmental justice impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will reduce the potential for environmental justice impacts.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for environmental justice have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.1.21 Transportation

#### 11.1.21.1 Affected Environment

The reduction in developable area of the SEZ does not change the information on affected environment provided in the Draft Solar PEIS.

#### 11.1.21.2 Impacts

As stated in the Draft Solar PEIS, the primary transportation impacts are anticipated to be from commuting worker traffic. Single projects could involve up to 1,000 workers each day, with an additional 2,000 vehicle trips per day (maximum). This additional traffic on U.S. 95 would represent a two-thirds increase in traffic volume in the area of the SEZ. Because higher traffic volumes would be experienced during shift changes, traffic on U.S. 95 could experience moderate slowdowns during these time periods in the general area of the SEZ. Local road improvements would be necessary on any portion of U.S. 95 that might be developed to avoid overwhelming the local access roads near any site access point(s). Potential existing site access roads would require improvements, including asphalt pavement.

Solar development within the SEZ would affect public access along OHV routes that are designated open and available for public use. Although open routes crossing areas granted ROWs for solar facilities could be redesignated as closed (see Section 5.5.1 of the Draft Solar PEIS), a programmatic design feature has been included under Recreation (Section A.2.2.6.1 of Appendix A) that requires consideration of replacement of lost OHV route acreage and of access across and to public lands.

#### 11.1.21.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce transportation impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. The programmatic design features, including local road improvements, multiple site access locations, staggered work schedules, and ride-sharing, would all provide some relief to traffic congestion on local roads leading to the SEZ. Depending on the location of solar facilities within the SEZ, more specific access locations and local road improvements could be implemented.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features to address transportation impacts in the proposed Amargosa Valley SEZ have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.1.22 Cumulative Impacts

The analysis of potential impacts in the vicinity of the proposed Amargosa Valley SEZ presented in the Draft Solar PEIS is still generally applicable for this Final Solar PEIS, although the impacts would be decreased because the size of the developable area of the proposed SEZ has been reduced to 8,479 acres (34.3 $km^2$). Also, several previously pending projects now have been dropped (there are now only six pending projects). The following sections include an update to the information presented in the Draft Solar PEIS regarding cumulative effects for the proposed Amargosa Valley SEZ.

### 11.1.22.1 Geographic Extent of the Cumulative Impacts Analysis

The geographic extent of the cumulative impact analysis has not changed. The extent varies on the basis of the nature of the resource being evaluated and the distance at which the impact may occur (e.g., air quality impacts may have a greater geographic extent than visual resources impacts). Most of the lands around the Amargosa Valley SEZ are administered by the BLM, the USFWS, the NPS, the U.S. Department of Energy (DOE), and the DoD. The BLM administers approximately 28% of the lands within a 50-mi (80-km) radius of the SEZ.

### 11.1.22.2 Overview of Ongoing and Reasonably Foreseeable Future Actions

The Draft Solar PEIS included six other proposed SEZs in Nevada. Two of these, Delamar Valley and East Mormon Mountain, have been removed from consideration.

One project (the Amargosa Farm Road project) has been authorized within a 50-mi (80-km) radius of the proposed Amargosa Valley SEZ. Although the Amargosa Farm Road project has an authorized ROW application, additional case processing and environmental review will be required to consider a post-authorization request to change technology to PV.

There are also six pending ROW applications for solar facilities within 50 mi (80 km) of the Amargosa Valley SEZ that could generate up to 2,610 MW on public lands in Nevada (see list in Appendix B of this Final Solar PEIS). However, these applications are in various stages of approval, and for many, environmental assessments have not been completed. Only the Amargosa North Solar Project adjacent to the southern boundary of the SEZ and the Lathrop Wells project, about 10 mi (16 km) southeast of the SEZ, have advanced to consideration as reasonably foreseeable actions (because there are firm near-term plans and environmental documentation has been completed). As of the end of October 2011, the other pending solar applications were not considered reasonably foreseeable future actions.

The list of reasonably foreseeable future actions related to energy production and distribution, including potential solar energy projects under the proposed action near the proposed Amargosa Valley SEZ, has been updated and is presented in Table 11.1.22.2-1. Projects listed in the table are shown in Figure 11.1.22.2-1. One project not previously described in the Draft Solar PEIS is described in the following section.

#### *11.1.22.2.1 Lathrop Wells Solar Facility*

Abengoa Solar, Inc., proposes to construct and operate a 250-MW parabolic trough solar generating facility, with an option to add a second 250-MW unit. The project may also include a 20-MW PV solar unit. The site is located on 5,336 acres (21.6 km$^2$) of BLM land in Amargosa Valley, 10 mi (16 km) southeast of the SEZ. The project would utilize a dry-cooling system to minimize water requirements (BLM 2012b).

#### *11.1.22.2.2 Other Actions*

The list of other major ongoing and foreseeable actions within 50 mi (80 km) of the proposed Amargosa Valley SEZ has been updated and is presented in Table 11.1.22.2-2.

### 11.1.22.3 General Trends

The information on general trends presented in the Draft Solar PEIS remains valid.

### 11.1.22.4 Cumulative Impacts on Resources

Total disturbance over 20 years in the proposed Amargosa Valley SEZ is assumed to be about 6,783 acres (27.5 km$^2$) (80% of the entire proposed SEZ). This development would contribute incrementally to the impacts from other past, present, and reasonably foreseeable future actions in the region as described in the Draft Solar PEIS. Primary impacts from development in the Amargosa Valley SEZ may include impacts on water quantity and quality, air quality, ecological resources such as habitat and species, cultural and visual resources, and on specially designated lands.

**TABLE 11.1.22.2-1 Ongoing and Reasonably Foreseeable Future Actions Related to Energy Development and Distribution near the Proposed Amargosa Valley SEZ as Revised[a]**

| Description | Status | Resources Affected | Primary Impact Location |
|---|---|---|---|
| ***Approved and Priority Solar Energy Projects on BLM-Administered Land*** | | | |
| Amargosa Farm Road Solar Energy Project (Solar Millennium) (NVN-84359), **484-MW, originally planned as parabolic trough; converting to PV**, **6,320 total acres[b,c]** | **ROD November 15, 2010** | Terrestrial habitats, wildlife | 6 mi[d] southeast of the SEZ |
| Amargosa North Solar Project (NVN-84465), 150-MW PV, 7,500 acres | NOI December 14, 2009 | Terrestrial habitats, wildlife | Adjacent to the SEZ |
| **Lathrop Wells Solar Project (Abengoa Solar) (NVN-86571), up to 500-MW parabolic trough, possibly 20-MW PV, 5,336 acres** | NOI July 15, 2010 | Terrestrial habitats, Wildlife | 10 mi southeast of the SEZ |
| ***Transmission and Distribution Systems*** | | | |
| 138-kV transmission line | Operating | | Corridor passes adjacent to the SEZ |

a Projects with status changed from that given in the Draft Solar PEIS are shown in bold text.

b See SEIA (2011) for details.

c To convert acres to km$^2$, multiply by 0.004047.

d To convert mi to km, multiply by 1.6093.

Activities in the region that will contribute to cumulative impacts include one additional solar project that that was not considered foreseeable at the time the Draft Solar PEIS was prepared: the Lathrop Wells Solar Facility. This will be a 250- to 500-MW dry-cooled parabolic trough facility.

Overall, the incremental cumulative impacts associated with the development of the proposed Amargosa Valley SEZ during construction, operation, and decommissioning are expected to be the same or less than those described in the Draft Solar PEIS. This is because the size of the Amargosa Valley SEZ has decreased by approximately 73%. Also, as a result of the change in technology from parabolic trough to PV in the nearby Amargosa Farm Road Solar

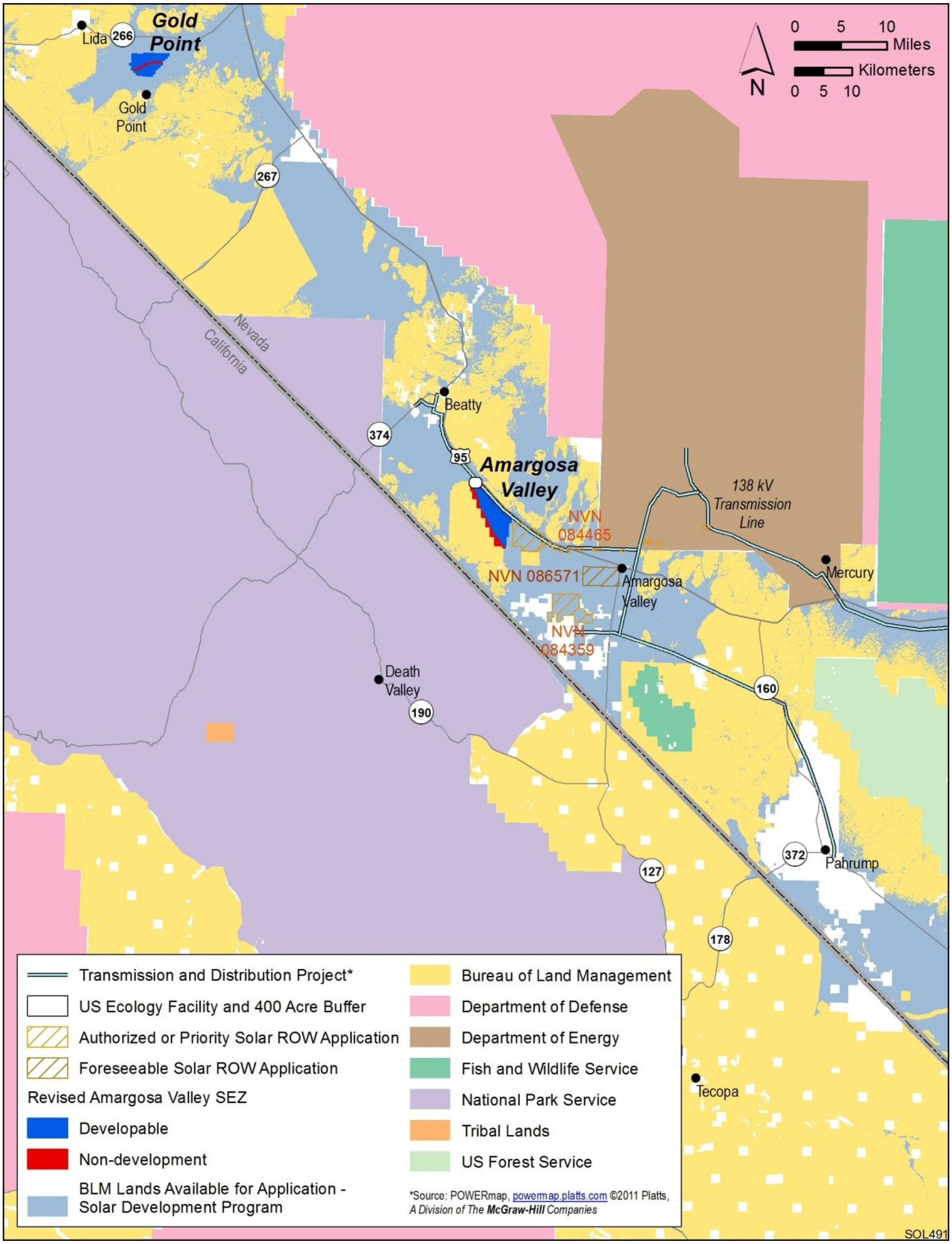


**FIGURE 11.1.22.2-1 Locations of Existing and Reasonably Foreseeable Renewable Energy Projects on Public Land within a 50-mi (80-km) Radius of the Proposed Amargosa Valley SEZ as Revised (Source: Platts 2011)**

**TABLE 11.1.22.2-2 Other Major Actions near the Proposed Amargosa Valley SEZ as Revised[a]**

| Description | Status | Resources Affected | Primary Impact Location |
|---|---|---|---|
| Beatty Water and Sanitation District Water Treatment Plant | EA November 2009 **Operation began March 16, 2011[b]** | Soils, minor other impacts | 10 mi[c] north of SEZ |
| Caliente Rail Realignment | FEIS June 2008 | Terrestrial habitats, wildlife cultural resources | 8 mi northeast of the SEZ |
| Hazardous Waste Management Facility | In operation since 1962 | Soils, terrestrial habitats, noise, air quality | Adjacent to the SEZ |

[a] Projects with status changed from that given in the Draft Solar PEIS are shown in bold text.

[b] See Stephens (2011) for details.

[c] To convert mi to km, multiply by 1.6093.

Energy Project, the projected water use impacts in the region are expected to be lower than projected in the Draft Solar PEIS.

## 11.1.23 Transmission Analysis

The methodology for this transmission analysis is described in Appendix G of this Final Solar PEIS. This section presents the results of the transmission analysis for the Amargosa Valley SEZ, including the identification of potential load areas to be served by power generated at the SEZ and the results of the dedicated-line transmission (DLT) analysis. Unlike Sections 11.1.2 through 11.1.22, this section is not an update of previous analysis for the Amargosa Valley SEZ; this analysis was not presented in the Draft Solar PEIS. However, the methodology and a test case analysis were presented in the Supplement to the Draft Solar PEIS. Comments received on the material presented in the Supplement were used to improve the methodology for the assessment presented in this Final Solar PEIS.

On the basis of its size, the assumption of a minimum of 5 acres (0.02 $km^2$) of land required per MW, and the assumption of a maximum of 80% of the land area developed, the Amargosa Valley SEZ is estimated to have the potential to generate 1,357 MW of marketable solar power at full build-out.

### 11.1.23.1 Identification and Characterization of Load Areas

The primary candidates for Amargosa Valley SEZ load areas are the major surrounding cities. Figure 11.1.23.1-1 shows the possible load areas for the Amargosa Valley SEZ and the estimated portion of their market that could be served by solar generation. Possible load areas for the Amargosa Valley SEZ include Phoenix, Arizona; Salt Lake City, Utah; Las Vegas and Reno, Nevada; and Los Angeles, San Jose, San Francisco, Oakland, and Sacramento, California.

The two load area groups examined for the Amargosa Valley SEZ are as follows:

1. Las Vegas, Nevada; and Los Angeles, California; and

2. Las Vegas, Nevada; and Phoenix, Arizona.

Figures 11.1.23.1-2 shows the most economically viable transmission scheme for the Amargosa Valley SEZ (transmission scheme 1), and Figure 11.1.23.1-3 shows an alternative transmission scheme (transmission scheme 2) that represents a logical choice should transmission scheme 1 be infeasible. As described in Appendix G, the alternative shown in transmission scheme 2 represents the optimum choice if one or more of the primary linkages in transmission scheme 1 are excluded from consideration. The groups provide for linking loads along alternative routes so that the SEZ's output of 1,357 MW could be fully allocated.

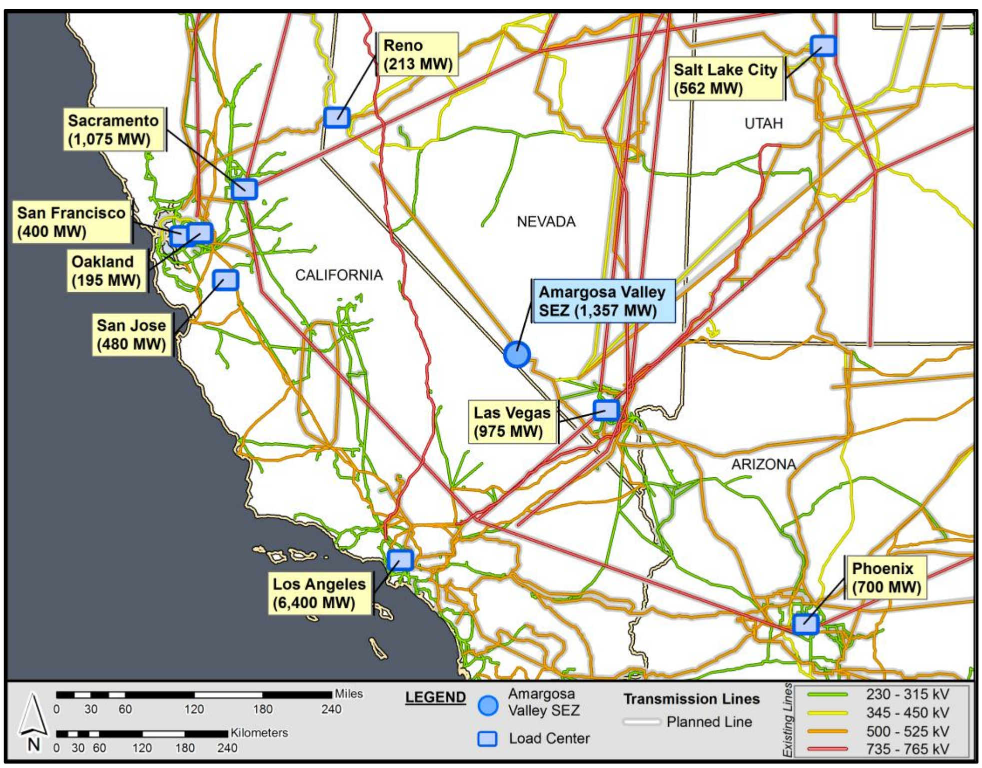


**FIGURE 11.1.23.1-1 Location of the Proposed Amargosa Valley SEZ and Possible Load Areas (Source for background map: Platts 2011)**

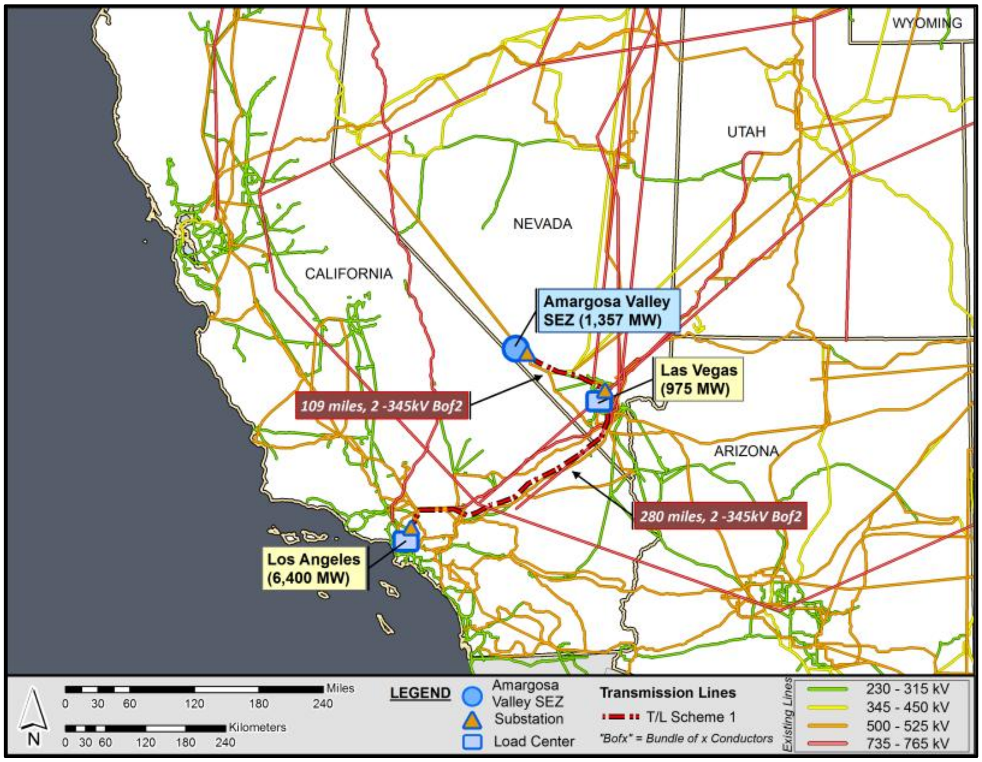


**FIGURE 11.1.23.1-2 Transmission Scheme 1 for the Proposed Amargosa Valley SEZ (Source for background map: Platts 2011)**

Table 11.1.23.1-1 summarizes and groups the load areas according to their associated transmission scheme and provides details on how the megawatt load for each area was estimated.

### 11.1.23.2 Findings for the DLT Analysis

The DLT analysis approach assumes that the Amargosa Valley SEZ will require all new construction for transmission lines (i.e., dedicated lines) and substations. The new transmission lines(s) would directly convey the 1,357-MW output of the Amargosa Valley SEZ to the prospective load areas for each possible transmission scheme. The approach also assumes that all existing transmission lines in the Western Electricity Coordinating Council (WECC) region are saturated and have little or no available capacity to accommodate the SEZ's output throughout the entire 10-year study horizon.

Figures 11.1.23.1-2 and 11.1.23.1-3 display the pathways that new dedicated lines might follow to distribute solar power generated at the Amargosa Valley SEZ via the two identified transmission schemes described in Table 11.1.23.1-1. These pathways parallel existing 500-, 345-, 230-kV, and/or lower voltage lines. The intent of following existing lines is to avoid pathways that may be infeasible due to topographical limitations or other concerns.


**FIGURE 11.1.23.1-3 Transmission Scheme 2 for the Proposed Amargosa Valley SEZ (Source for background map: Platts 2011)**

For transmission scheme 1, a new line would be constructed to connect with Las Vegas (975 MW) and Los Angeles (6,400 MW), so that the 1,357-MW output of the Amargosa Valley SEZ could be fully utilized by these two load centers (Figure 11.1.23.1-2). This particular scheme requires two segments. One segment extends to the southeast from the SEZ to Las Vegas (975 MW) over a distance of about 109 mi (175 km). This segment would require a double-circuit 345-kV (2-345 kV) bundle of two conductors (Bof2) transmission line design based on engineering and operational considerations. The second segment extends to the southwest from Las Vegas (975 MW) to Los Angeles (6,400 MW) over a distance of about 280 mi (451 km). This segment would require a double-circuit 345-kV bundle of two conductors (Bof2) transmission line design. In general, the transmission configuration options were determined using the line “loadability” curve provided in American Electric Power’s *Transmission Facts* (AEP 2010). Appendix G documents the line options used for this analysis and describes how the load area groupings were determined.

For transmission scheme 2 serving load centers to the southeast, Figure 11.1.23.1-3 shows that new lines would be constructed to connect with Las Vegas (975 MW) and Phoenix (700 MW), so that the 1,357-MW output of the Amargosa Valley SEZ could be fully utilized by these two load centers. This scheme requires two segments. The first segment extends to the southeast from the SEZ to Las Vegas (975 MW) over a distance of about 109 mi (175 km). This segment would require a double-circuit 345-kV bundle of two (Bof2) transmission line design.

**TABLE 11.1.23.1-1 Candidate Load Area Characteristics for the Proposed Amargosa Valley SEZ**

| Transmission Scheme | City/Load Area Name | Position Relative to SEZ | 2010 Population[c] | Estimated Total Peak Load (MW) | Estimated Peak Solar Market (MW) |
|---|---|---|---|---|---|
| 1 | Las Vegas, Nevada[a] | Southeast | 1,950,000 | 4,875 | 975 |
| | Los Angeles, California[a] | Southwest | 12,800,000 | 32,000 | 6,400 |
| 2 | Las Vegas, Nevada[a] | Southeast | 1,950,000 | 4,875 | 975 |
| | Phoenix, Arizona[b] | Southeast | 1,400,000 | 3,500 | 700 |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

[c] City and metropolitan area population data are from 2010 Census data (U.S. Bureau of the Census 2010).

The second segment runs about 294 mi (473 km) southeast from Las Vegas to Phoenix (700 MW). The second segment requires a double-circuit 345-kV bundle of two transmission line design.

Table 11.1.23.2-1 summarizes the distances to the various load areas over which new transmission lines would need to be constructed, as well as the assumed number of substations that would be required. One substation is assumed to be installed at each load area and an additional one at the SEZ. Thus, in general, the total number of substations per scheme is simply equal to the number of load areas associated with the scheme plus one. Substations at the load areas would consist of one or more step-down transformers, while the originating substation at the SEZ would consist of several step-up transformers. The originating substation would have a rating of at least 1,357 MW (to match the plant's output), while the combined-load substations would have a similar total rating of 1,357 MW. For schemes that require the branching of the lines, a switching substation is assumed to be constructed at the appropriate junction. In general, switching stations carry no local load but are assumed to be equipped with switching gears (e.g., circuit breakers and connecting switches) to reroute power as well as, in some cases, with additional equipment to regulate voltage.

Table 11.1.23.2-2 provides an estimate of the total land area disturbed for construction of new transmission facilities under each of the schemes evaluated. The most favorable transmission scheme with respect to minimizing costs and the area disturbed would be scheme 1, which would serve Las Vegas and Los Angeles. This scheme is estimated to potentially disturb about 8,284 acres (33.5 km$^2$) of land. The less favorable transmission scheme with respect to minimizing costs and the area disturbed would be scheme 2, which serves Las Vegas and Phoenix loads. For this scheme, the construction of new transmission lines and substations is estimated to disturb a land area on the order of 8,581 acres (34.7 km$^2$).

**TABLE 11.1.23.2-1 Potential Transmission Schemes, Estimated Solar Markets, and Distances to Load Areas for the Proposed Amargosa Valley SEZ**

| Transmission Scheme | City/Load Area Name | Estimated Peak Solar Market (MW)[c] | Total Solar Market (MW) | Sequential Distance (mi)[c] | Total Distance (mi)[d] | Line Voltage (kV) | No. of Substations |
|---|---|---|---|---|---|---|---|
| 1 | Las Vegas, Nevada[a] | 975 | 7,375 | 109 | 389 | 345 | 3 |
| | Los Angeles, California[a] | 6,400 | | 280 | | | |
| 2 | Las Vegas, Nevada[a] | 975 | 1,675 | 109 | 403 | 345 | 3 |
| | Phoenix, Arizona[b] | 700 | | 294 | | | |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

[c] From Table 11.1.23.1-1.

[d] To convert mi to km, multiply by 1.6093.

**TABLE 11.1.23.2-2 Comparison of the Various Transmission Line Configurations with Respect to Land Use Requirements for the Proposed Amargosa Valley SEZ**

| Transmission Scheme | City/Load Area Name | Total Distance (mi)[c] | No. of Substations | Land Use (acres)[d] Transmission Line | Land Use (acres)[d] Substation | Land Use (acres)[d] Total |
|---|---|---|---|---|---|---|
| 1 | Las Vegas, Nevada[a] | 389 | 3 | 8,251.5 | 32.6 | 8,284.1 |
| | Los Angeles, California[a] | | | | | |
| 2 | Las Vegas, Nevada[a] | 403 | 3 | 8,548.5 | 32.6 | 8,581.1 |
| | Phoenix, Arizona[b] | | | | | |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

[c] To convert mi to km, multiply by 1.6093.

[d] To convert acres to $km^2$, multiply by 0.004047.

Table 11.1.23.2-3 shows the estimated net present value (NPV) of both transmission schemes and takes into account the cost of constructing the lines, the substations, and the projected revenue stream over the 10-year horizon. A positive NPV indicates that revenue more than offsets investments. This calculation does not include the cost of producing electricity.

The most economically attractive configuration (transmission scheme 1) has the highest positive NPV and serves Las Vegas and Los Angeles. The secondary case (transmission scheme 2), which excludes one or more of the primary pathways used in scheme 1, is less economically attractive and focuses on delivering power to the Las Vegas and Phoenix markets. For the assumed utilization factor of 20%, both options exhibit positive NPVs of similar magnitude, implying similar degrees of economic viability under the current assumptions.

Table 11.1.23.2-4 shows the effect of varying the value of the utilization factor on the NPV of the transmission schemes. It also shows that as the utilization factor is increased, the economic viability of the lines also increases. Utilization factors can be raised by allowing the new dedicated lines to market other power generation outputs in the region in addition to that of its associated SEZ.

The findings of the DLT analysis for the proposed Amargosa Valley SEZ are as follows:

- Transmission scheme 1, which identifies Las Vegas and Los Angeles as the primary markets, represents the most favorable option based on NPV and land use requirements. This configuration would result in new land disturbance of about 8,284 acres (33.5 km$^2$).

- Transmission scheme 2, which represents an alternative configuration, serves Las Vegas and Phoenix. This configuration would result in new land disturbance of about 8,581 acres (34.7 km$^2$).

**TABLE 11.1.23.2-3 Comparison of Potential Transmission Lines with Respect to NPV (Base Case) for the Proposed Amargosa Valley SEZ**

| Transmission Scheme | City/Load Area Name | Present Value Transmission Line Cost ($ million) | Present Value Substation Cost ($ million) | Annual Sales Revenue ($ million) | Present Worth of Revenue Stream ($ million) | NPV ($ million) |
|---|---|---|---|---|---|---|
| 1 | Las Vegas, Nevada[a]<br>Los Angeles, California[a] | 972.5 | 89.6 | 237.7 | 1,835.8 | 773.8 |
| 2 | Las Vegas, Nevada[a]<br>Phoenix, Arizona[b] | 1,007.5 | 89.6 | 237.7 | 1,835.8 | 738.8 |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

**TABLE 11.1.23.2-4 Effects of Varying the Utilization Factor on the NPV of the Transmission Schemes for the Proposed Amargosa Valley SEZ**

| | | NPV ($ million) at Different Utilization Factors | | | | | |
|---|---|---|---|---|---|---|---|
| Transmission Scheme | City/Load Area Name | 20% | 30% | 40% | 50% | 60% | 70% |
| 1 | Las Vegas, Nevada[a]<br>Los Angeles, California[a] | 774 | 1,692 | 2,610 | 3,527 | 4,445 | 5,363 |
| 2 | Las Vegas, Nevada[a]<br>Phoenix, Arizona[b] | 739 | 1,657 | 2,272 | 3,492 | 4,410 | 5,328 |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

- Other load area configurations are possible but would be less favorable than scheme 1 in terms of NPV and, in most cases, also in terms of land use requirements. If new electricity generation at the proposed Amargosa SEZ is not sent to either of the two markets identified above, the potential upper-bound impacts in terms of cost would be greater.

- The analysis of transmission requirements for the Amargosa Valley SEZ would be expected to show lower costs and less land disturbance if solar-eligible load assumptions were increased, although the magnitude of those changes would vary due to a number of factors. In general, for cases such as the Amargosa Valley SEZ that show multiple load areas being served to accommodate the specified capacity, the estimated costs and land disturbance would be affected by increasing the solar-eligible load assumption. By increasing the eligible loads at all load areas, the transmission routing and configuration solutions can take advantage of shorter line distances and deliveries to fewer load areas, thus reducing costs and land disturbed. In general, SEZs that show the greatest number of load areas served and greatest distances required for new transmission lines (e.g., Riverside East) would show the greatest decrease in impacts as a result of increasing the solar-eligible load assumption from 20% to a higher percentage.

## 11.1.24 Impacts of the Withdrawal

The BLM is proposing to withdraw 9,737 acres (39 km$^2$) of public land comprising the proposed Amargosa Valley SEZ from settlement, sale, location, or entry under the general land laws, including the mining laws, for a period of 20 years (see Section 2.2.2.2.4 of the Final Solar PEIS). The public lands would be withdrawn, subject to valid existing rights, from settlement, sale, location, or entry under the general land laws, including the mining laws. This means that the lands could not be appropriated, sold, or exchanged during the term of the withdrawal, and new mining claims could not be filed on the withdrawn lands. Mining claims filed prior to the segregation or withdrawal of the identified lands would take precedence over future solar energy development. The withdrawn lands would remain open to the mineral leasing, geothermal leasing, and mineral material laws, and the BLM could elect to lease the oil, gas, coal, or geothermal steam resources, or to sell common-variety mineral materials, such as sand and gravel, contained in the withdrawn lands. In addition, the BLM would retain the discretion to authorize linear and renewable energy ROWs on the withdrawn lands.

The purpose of the proposed land withdrawal is to minimize the potential for conflicts between mineral development and solar energy development for the proposed 20-year withdrawal period. Under the land withdrawal, there would be no mining-related surface development, such as the establishment of open pit mining, construction of roads for hauling materials, extraction of ores from tunnels or adits, or construction of facilities to process the material mined, that could preclude use of the SEZ for solar energy development. For the Amargosa Valley SEZ, the impacts of the proposed withdrawal on mineral resources and related economic activity and employment are expected to be negligible because the mineral potential of the lands within the SEZ is low (BLM 2012a). There has been no documented mining within the SEZ, and there are no known locatable mineral deposits within the land withdrawal area. According to the Legacy Rehost 2000 System (LR2000) (accessed in May 2012), there are no recorded mining claims within the land withdrawal area.

Although the mineral potential of the lands within the Amargosa Valley SEZ is low, the proposed withdrawal of lands within the SEZ would preclude many types of mining activity over a 20-year period, resulting in the avoidance of potential mining-related adverse impacts. Impacts commonly related to mining development include increased soil erosion and sedimentation, water use, generation of contaminated water in need of treatment, creation of lagoons and ponds (hazardous to wildlife), toxic runoff, air pollution, establishment of noxious weeds and invasive species, habitat destruction or fragmentation, disturbance of wildlife, blockage of migration corridors, increased visual contrast, noise, destruction of cultural artifacts and fossils and/or their context, disruption of landscapes and sacred places of interest to tribes, increased traffic and related emissions, and conflicts with other land uses (e.g., recreational).

### 11.1.25 References

*Note to Reader:* This list of references identifies Web pages and associated URLs where reference data were obtained for the analyses presented in this Final Solar PEIS. It is likely that at the time of publication of this Final Solar PEIS, some of these Web pages may no longer be available or their URL addresses may have changed. The original information has been retained and is available through the Public Information Docket for this Final Solar PEIS.

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## 11.1.26 Errata for the Proposed Amargosa Valley SEZ

This section presents corrections to material presented in the Draft Solar PEIS and the Supplement to the Draft. The need for these corrections was identified in several ways: through comments received on the Draft Solar PEIS and the Supplement to the Draft (and verified by the authors), through new information obtained by the authors subsequent to publication of the Draft Solar PEIS and the Supplement to the Draft, or through additional review of the original material by the authors. Table 11.1.26-1 provides corrections to information presented in the Draft Solar PEIS and the Supplement to the Draft.

**TABLE 11.1.26-1 Errata for the Proposed Amargosa Valley SEZ (Section 11.1 of the Draft Solar PEIS and Section C.4.1 of the Supplement to the Draft Solar PEIS)**

| Section No. | Page No. | Line No. | Figure No. | Table No. | Correction |
|---|---|---|---|---|---|
| 11.1.11.2 | | | | | All uses of the term "neotropical migrants" in the text and tables of this section should be replaced with the term "passerines." |
| 11.1.15.2.1 | 11.1-262 | 21 | | | "For the parabolic trough and power tower technologies..." should read "For construction activities associated with solar power technologies..." |
| C.4.1.5.11 | C-159 through C-161 | | | | The California Desert National Conservation Area (CDNCA) was omitted from the discussion of sensitive visual resource areas that would be subject to moderate or strong visual contrast from solar development within the Amargosa Valley SEZ in Section C.4.1.5.11 of the Supplement. Because of the proximity of this resource area to the SEZ, the potential for open views of the SEZ, and the presence of elevated viewpoints, weak to strong visual contrasts could be observed by visitors to this area. This resource area consists of 25,919,319 acres (104,892 $km^2$). Portions of the CDNCA within the 650-ft (198.1-m) viewshed for the Amargosa Valley SEZ, as presented in the Draft Solar PEIS, include approximately 94,485 acres (382.37 $km^2$), or 0.4% of the total CDNCA acreage. |

## 11.2 DELAMAR VALLEY

As stated at the beginning of this chapter, the Delamar Valley SEZ was dropped from further consideration through the Supplement to the Draft Solar PEIS. This section presents the information (with minor updates) provided in Appendix B of the Supplement to the Draft Solar PEIS on the rationale for dropping this SEZ.

### 11.2.1 Summary of Potential Impacts Identified in the Draft Solar PEIS

The proposed Delamar Valley SEZ, as presented in the Draft Solar PEIS, had a total area of 16,552 acres (67 $km^2$). It is located in Lincoln County in southeastern Nevada (Figure 11.2.1-1). The largest nearby town is Alamo, Nevada, about 11 mi (18 km) west of the SEZ.

The Draft Solar PEIS identified U.S. 93, about 9 mi (14.5 km) west of the SEZ, as the nearest major road and assumed that a new access road would be constructed from there to the proposed SEZ to support development (see Figure 11.2.1-1). The Draft Solar PEIS identified a locally designated transmission corridor that occupies about 2,919 acres (12 $km^2$), or 22% of the eastern portion of the proposed Delamar Valley SEZ, and a ROW application from the Southern Nevada Water Authority (SNWA) for a pipeline that would pass through the middle of the proposed SEZ. Both of these ROWs could limit development in the SEZ because solar facilities cannot be constructed under transmission lines or over pipelines. Further, the Draft Solar PEIS discussion of impacts of solar energy development in the SEZ acknowledged that solar facility development on both sides of the corridor would limit the ability to add future corridor capacity.

Potential environmental and other impacts identified in the Draft Solar PEIS included the following:

- Because of the 14-mi (23-km) length of the SEZ, east to west travel across the valley could be cut off, requiring extensive detours for recreational users of the public land (this area is a popular recreation area).

- Visual impacts of solar energy development would have the potential to affect wilderness characteristics of the Delamar Mountains and South Pahroc WAs. Night-time lighting of solar development could adversely affect the quality of the night sky environment in adjacent specially designated areas.

- If full solar development would occur in the SEZ, the federal grazing permit for the Buckhorn grazing allotment would be reduced in area by about 18% and about 606 animal unit months (AUMs) would be lost. Because the SEZ would occupy some of the best grazing land in the allotment, it is possible that the grazing operation woud become economically infeasible and that all 3,709 AUMs currently authorized would be lost.

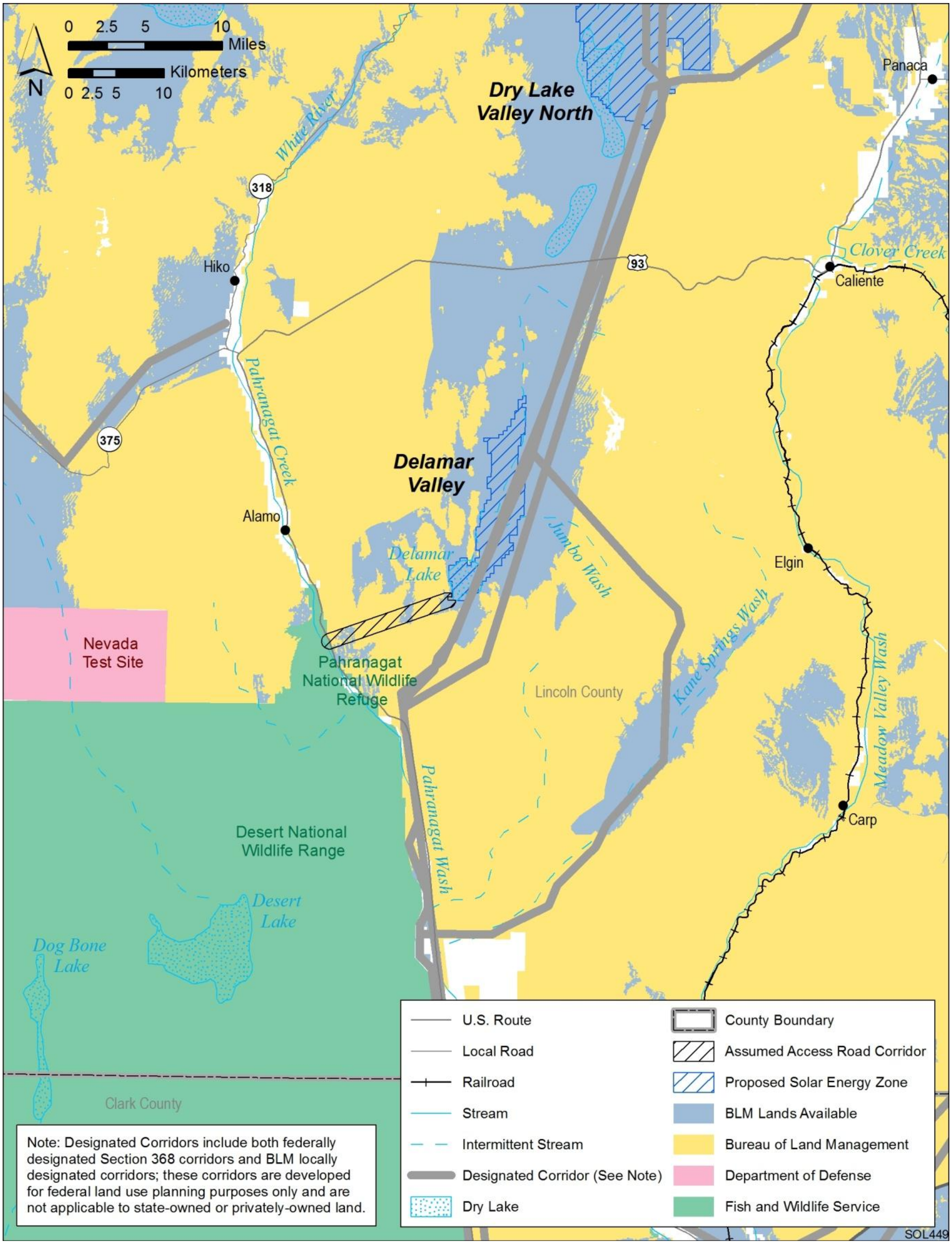


**FIGURE 11.2.1-1 Proposed Delamar Valley SEZ as Presented in the Draft Solar PEIS**

- Because the SEZ includes numerous roads and trails, construction of solar energy facilities could have a major impact on existing recreational travel.

- The DoD expressed serious concern over construction of solar energy facilities within the SEZ, and Nellis Air Force Base indicated that any facilities with structures higher than 100 ft (30 m) may be incompatible with low-level aircraft use of the military training range. The Nevada Test and Training Range (NTTR) indicated that solar technologies requiring structures higher than 50 ft (15 m) AGL may present unacceptable electromagnetic compatibility concerns for its test mission.

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion by wind and runoff, sedimentation, and soil contamination) could occur. Delamar Lake may not be a suitable location for construction.

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.

- Clearing of a large portion of the proposed SEZ could primarily affect communities associated with Delamar Lake and other playa habitats, Jumbo Wash and the unnamed intermittent stream, greasewood flats communities, riparian habitats, marshes, or other intermittently flooded areas, depending on the amount of habitat disturbed. Joshua tree communities within the northern portion of the SEZ and within the assumed access road corridor could be directly or indirectly affected. The establishment of noxious weeds could result in habitat degradation. Deposition of fugitive dust could cause reduced productivity or changes in plant community structure

- Potentially suitable habitat for 49 special status species occurs in the affected area of the proposed SEZ; potential impacts on these species and any wildlife species could range from small to large depending on the solar energy technology deployed, the scale of development within the SEZ, and the cumulative rate of groundwater withdrawals.

- If aquatic biota are present in Delamar Lake playa, dry washes, or a nearby marsh, they could be affected by the direct removal of surface water features within the construction footprint, a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary.

- Although the SEZ is in an area of low scenic quality, strong visual contrasts could be observed by residents nearest to the SEZ. Strong visual contrasts could also be observed by visitors to the Delamar Valley WA, North Delamar SRMA, and the Pahranagat SRMA. Weak to strong visual contrasts could be observed by visitors to the South Pahroc Range WA.

- Few, if any, impacts on significant paleontological resources are likely to occur in 73% of the proposed SEZ, while the potential in the remaining 27% of the SEZ is unknown. The SEZ has a high potential for containing prehistoric sites, especially in the dry lake area at the southern end of the SEZ; thus, direct impacts on significant cultural resources could occur in the proposed SEZ. Indirect impacts on cultural resources outside of the SEZ are possible in rock shelter and petroglyph sites immediately west of the SEZ. Visual impacts on areas of traditional cultural importance could occur.

- Both minority and low-income populations occur within a 50-mi (80-km) radius of the proposed SEZ boundary; thus adverse impacts of solar development could disproportionately affect minority and low-income populations.

### 11.2.2 Summary of Comments Received

Many comments received on the proposed Delamar Valley SEZ were in favor of eliminating the area as an SEZ (N-4 State Grazing Board; DoD; Lincoln County, Nevada; and Western Watersheds Project [WWP]). Many comments expressed concern for ranching operations in the area and the effect of solar development in the proposed SEZ on grazing allotments in the area.

The Wilderness Society et al.[1] and Nevada Wilderness Project suggested removing the southern end of the SEZ because the sensitive resources in the playa lake make it inappropriate for solar development. The DoD was concerned that any development in the SEZ would have an immediate adverse effect on current and future DoD operations on the NTTR. In comments on the Draft Solar PEIS, Lincoln County opposed designation of Delamar Valley as an SEZ because of its potential adverse impacts on water resources, soil resources, vegetation resources, visual resources, recreation, livestock grazing, wildlife, and county socioeconomics. If, however, the SEZ were to be carried forward, Lincoln County recommended that only PV technologies be considered because of the lack of groundwater resources in the area. In subsequent comments, Lincoln County has requested that the former area of the Delamar Valley SEZ be designated as a solar development exclusion area.

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[1] The Wilderness Society, Center for Biological Diversity, Defenders of Wildlife, Sierra Club–Toiyabe Chapter, National Parks Conservation Association, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Nevada SEZs. Those comments are attributed to The Wilderness Society et al.

The Nevada Wilderness Project recommended avoiding Joshua tree habitat along the northern portion of the SEZ. The WPP and The Wilderness Society et al. recommended eliminating Delamar Valley as an SEZ because of the region's limited groundwater availability and because the groundwater basin is fully appropriated. The SNWA expressed concern over impacts on ROWs for the Groundwater Development Project.

An ethnographic study for the Delamar Valley SEZ area was recently conducted, and a summary of that study was presented in the Supplement to the Draft Solar PEIS. The agencies value the information shared by the Tribes during the ethnographic study and will consider their input in striving to minimize the impacts of solar development. The completed ethnographic study is available in its entirety on the Solar PEIS Web site (http://solareis.anl.gov).

### 11.2.3 Rationale for Eliminating the SEZ

On the basis of public comments received on the Draft Solar PEIS, review by the BLM, and continued review of potential impacts identified in the Draft Solar PEIS, the Delamar Valley SEZ was eliminated from further consideration and will not be identified as an SEZ in applicable land use plans. The potential impacts from solar development in the proposed Delamar Valley SEZ were considered sufficient reason to eliminate the area from further consideration.

Although the area has been dropped from consideration as an SEZ, the lands that composed the proposed Delamar Valley SEZ will be retained as solar ROW variance areas, because the BLM expects that individual projects could be sited in this area to avoid and/or minimize impacts. Any solar development within this area in the future would require appropriate environmental analysis.

### 11.2.4 References

*Note to Reader:* This list of references identifies Web pages and associated URLs where reference data were obtained for the analyses presented in this Final Solar PEIS. It is likely that at the time of publication of this Final Solar PEIS, some of these Web pages may no longer be available or their URL addresses may have changed. The original information has been retained and is available through the Public Information Docket for this Final Solar PEIS.

SWCA and University of Arizona (SWCA Environmental Consultants and Bureau of Applied Research in Anthropology), 2011, *Ethnographic and Class I Records Searches for Proposed Solar Energy Zones in California, Nevada, and Utah for the Bureau of Land Management's Solar Programmatic Environmental Impact Statement*, prepared by SWCA Environmental Consultants, Albuquerque, N.M., and Bureau of Applied Research in Anthropology, University of Arizona, Tucson, Ariz., Dec.

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## 11.3 DRY LAKE

### 11.3.1 Background and Summary of Impacts

#### 11.3.1.1 General Information

The proposed Dry Lake SEZ is located in Clark County in southern Nevada. In 2008, the county population was 1,879,093. The towns of Moapa Town and Overton are as close as 18 mi (29 km) northeast and 23 mi (37 km) east of the SEZ, respectively. Nellis Air Force Base is located approximately 13 mi (21 km) southwest of the SEZ. The nearest major roads accessing the proposed Dry Lake SEZ are I-15, which passes along the southeastern boundary of the SEZ, and U.S. 93, which runs from northwest to southeast along part of the southwest border of the SEZ. The UP Railroad runs north to south along a portion of the eastern SEZ boundary, with the nearest stop in Las Vegas. As of October 28, 2011, there were three pending solar applications within or adjacent to the SEZ and an additional large application area located about 2 mi (3 km) to the east of the SEZ across I-15.

As published in the Draft Solar PEIS (BLM and DOE 2010), the proposed Dry Lake SEZ had a total area of 15,649 acres (63 km$^2$). In the Supplement to the Draft Solar PEIS (BLM and DOE 2011), the size of the SEZ was reduced, eliminating 9,463 acres (38 km$^2$) to include only the southernmost area that is northwest of I-15 (see Figure 11.3.1.1-1). Eliminating the northern portion of the SEZ is primarily intended to avoid or minimize some potential impacts from development in the SEZ, including impacts on desert tortoise and other wildlife and on military operations. In addition, 469 acres (1.9 km$^2$) of floodplain and wetland were identified as non-development areas. The remaining developable area within the SEZ is 5,717 acres (23 km$^2$).

The lands eliminated from the proposed Dry Lake SEZ will be retained as solar ROW variance areas, because the BLM expects that individual projects could be sited in these areas to avoid and/or minimize impacts. Any solar development within these areas in the future would require appropriate environmental analysis.

The analyses in the following sections update the affected environment and potential environmental, cultural, and socioeconomic impacts associated with utility-scale solar energy development in the Dry Lake SEZ as described in the Draft Solar PEIS.

#### 11.3.1.2 Development Assumptions for the Impact Analysis

Maximum solar development of the Dry Lake SEZ was assumed to be 80% of the developable SEZ area over a period of 20 years, a maximum of 4,574 acres (18.5 km$^2$) (see Figure 11.3.1.1-2). Full development of the Dry Lake SEZ would allow development of facilities with an estimated total of between 508 MW (power tower, dish engine, or PV technologies, 9 acres/MW [0.04 km$^2$/MW]) and 915 MW (solar trough technologies, 5 acres/MW [0.02 km$^2$/MW]) of electrical power capacity.

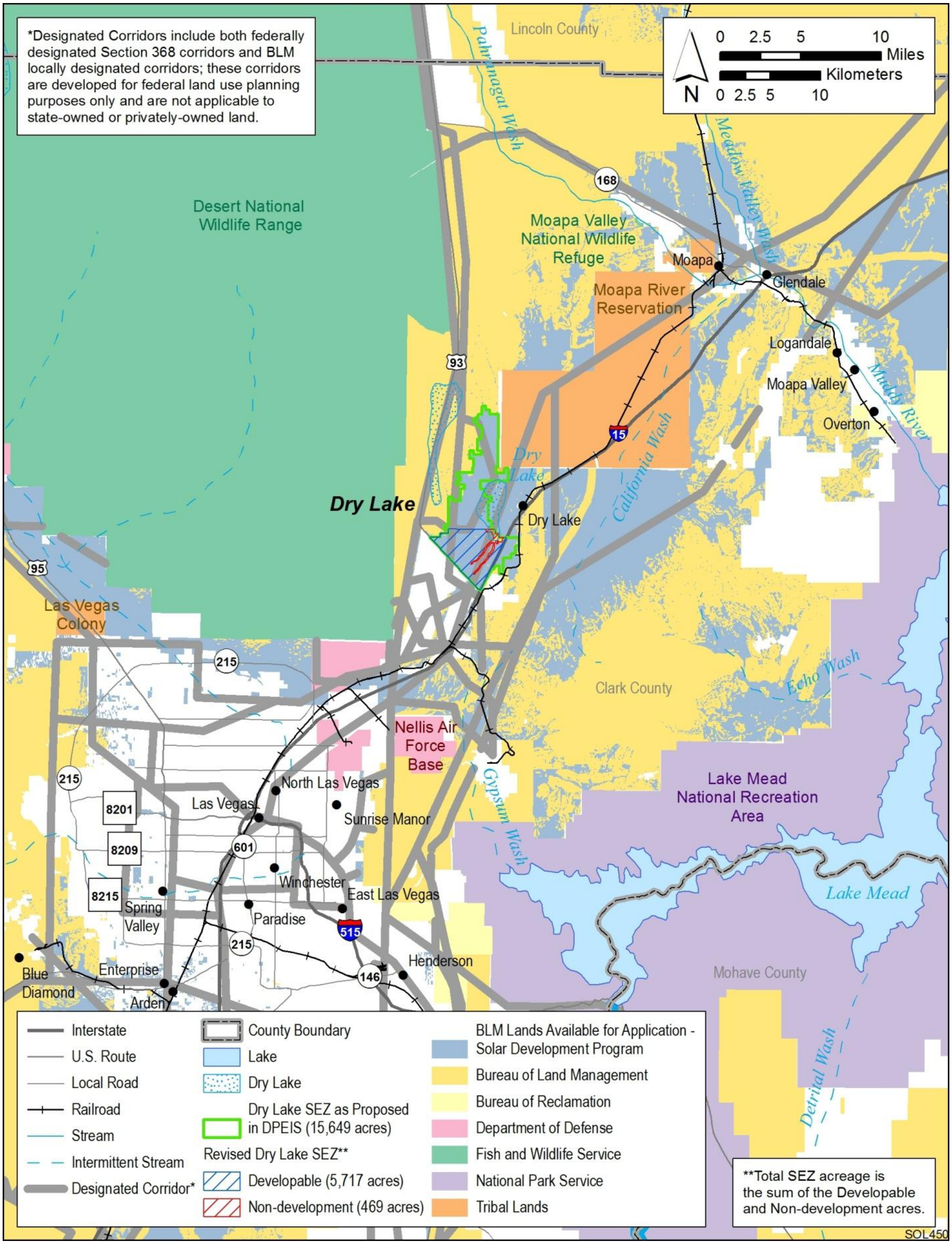


**FIGURE 11.3.1.1-1 Proposed Dry Lake SEZ as Revised**

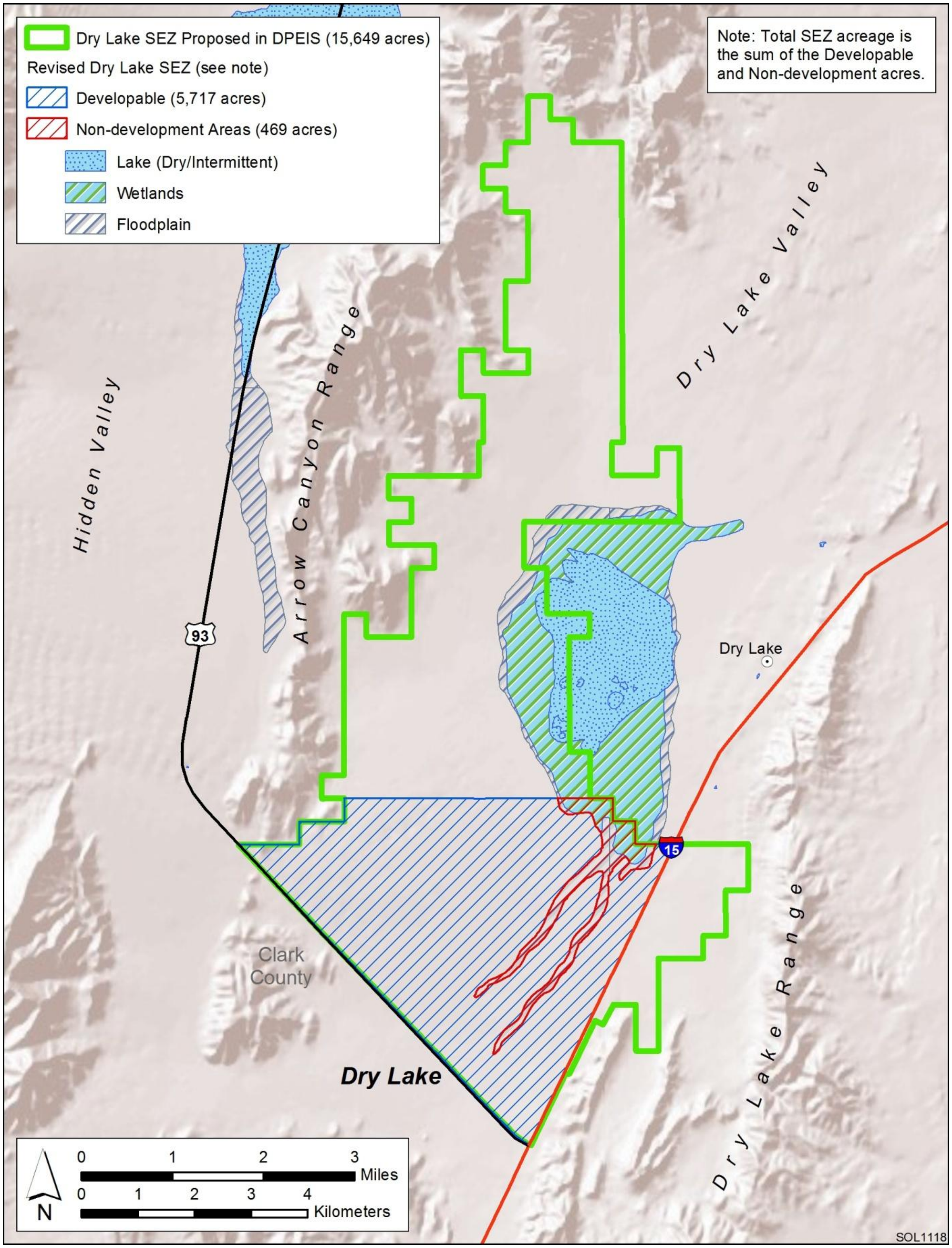


**FIGURE 11.3.1.1-2 Developable and Non-development Areas for the Proposed Dry Lake SEZ as Revised**

Availability of transmission from SEZs to load centers will be an important consideration for future development in SEZs. For the proposed Dry Lake SEZ, several existing transmission lines, including a 500-kV line, run through the SEZ. It is possible that an existing line could be used to provide access from the SEZ to the transmission grid, but a 500-kV capacity line may not be adequate for 508 to 915 MW of new capacity (a 500-kV line can accommodate approximately the load of one 700-MW facility). Therefore, at full build-out capacity, new transmission and possibly upgrades of existing transmission lines may be required to bring electricity from the proposed Dry Lake SEZ to load centers. An assessment of the most likely load center destinations for power generated at the Dry Lake SEZ and a general assessment of the impacts of constructing and operating new transmission facilities on those load centers is provided in Section 11.3.23. In addition, the generic impacts of transmission and associated infrastructure construction and of line upgrades for various resources are discussed in Chapter 5 of this Final Solar PEIS. Project-specific analyses would also be required to identify the specific impacts of new transmission construction and line upgrades for any projects proposed within the SEZ.

The Dry Lake SEZ partially overlaps three locally designated transmission corridors that are heavily developed with natural gas, petroleum product, and electric transmission lines (including a 500-kV transmission line). For this impact assessment, it is assumed that up to 80% of the proposed SEZ could be developed. This does not take into account the potential limitations to solar development that may result from siting constraints associated with these corridors. The development of solar facilities and existing corridors will be dealt with by the BLM on a case-by-case basis, see Section 11.3.2.2 on impacts on lands and realty for further discussion.

For the proposed Dry Lake SEZ, I-15 and U.S. 93 are adjacent to the SEZ. Existing road access to the proposed Dry Lake SEZ should be adequate to support construction and operation of solar facilities. No additional road construction outside of the SEZ was assumed to be required to support solar development, as summarized in Table 11.3.1.2-1.

#### 11.3.1.3 Programmatic and SEZ-Specific Design Features

The proposed programmatic design features for each resource area to be required under the BLM Solar Energy Program are presented in Section A.2.2 of Appendix A of this Final Solar PEIS. These programmatic design features are intended to avoid, minimize, and/or mitigate adverse impacts of solar energy development and will be required for development on all BLM-administered lands including SEZ and non-SEZ lands.

The discussions below addressing potential impacts of solar energy development on specific resource areas (Sections 11.3.2 through 11.3.22) also provide an assessment of the effectiveness of the programmatic design features in mitigating adverse impacts from solar development within the SEZ. SEZ-specific design features to address impacts specific to the proposed Dry Lake SEZ may be required in addition to the programmatic design features. The proposed SEZ-specific design features for the Dry Lake SEZ have been updated on the

**TABLE 11.3.1.2-1 Assumed Development Acreages, Solar MW Output, and Nearest Major Access Road and Transmission Line for the Proposed Dry Lake SEZ as Revised**

| Total Developable Acreage and Assumed Developed Acreage (80% of Total) | Assumed Maximum SEZ Output for Various Solar Technologies | Distance to Nearest State, U.S., or Interstate Highway | Distance and Capacity of Nearest Existing Transmission Line | Assumed Area of Road ROW | Distance to Nearest Designated Corridor[e] |
|---|---|---|---|---|---|
| 5,717 acres[a] and 4,574 acres | 508 MW[b] 915 MW[c] | I-15 and U.S. 93, 0 mi[d] | 0 mi and 500 kV | 0 acres | 0 mi |

[a] To convert acres to $km^2$, multiply by 0.004047.

[b] Maximum power output if the SEZ were fully developed using power tower, dish engine, or PV technologies, assuming 9 acres/MW (0.04 $km^2$/MW) of land required.

[c] Maximum power output if the SEZ were fully developed using solar trough technologies, assuming 5 acres/MW (0.02 $km^2$/MW) of land required.

[d] To convert mi to km, multiply by 1.6093.

[e] BLM-designated corridors are developed for federal land use planning purposes only and are not applicable to state-owned or privately owned land.

basis of revisions to the SEZ since the Draft Solar PEIS (such as boundary changes and the identification of non-development areas), and on the basis of comments received on the Draft and Supplement to the Draft. All applicable SEZ-specific design features identified to date (including those from the Draft Solar PEIS that are still applicable) are presented in Sections 11.3.2 through 11.3.22.

## 11.3.2 Lands and Realty

### 11.3.2.1 Affected Environment

The total size of the proposed SEZ has been reduced from 15,649 acres (63 $km^2$) to 6,186 acres (25 $km^2$), and the remaining area is the southern portion of the original SEZ. The northern boundary of the revised SEZ is about 7.5 mi (12 km) south of the original northern boundary, and the southeastern boundary is now located just west of I-15. Although the area is reduced in size, the general description of the southern portion of the area presented in the Draft Solar PEIS is still accurate. There were three active solar applications within or adjacent to the SEZ as of October 28, 2011, and an additional large application area located about 1 mi (1.6 km) to the east of the SEZ across I-15.

Three designated transmission corridors that are heavily developed with natural gas, petroleum product, and electric transmission lines (including a 500-kV transmission line) pass through the proposed SEZ.

#### 11.3.2.2 Impacts

Solar development of the SEZ would establish a large industrial area that would exclude many existing and potential uses of the land, perhaps in perpetuity. Full development of the revised proposed SEZ is anticipated to disturb up to 4,574 acres (18.5 $km^2$). The amount of existing electrical transmission and pipelines within the SEZ has been reduced by the boundary changes for the SEZ, but the proposed Dry Lake SEZ still partially overlaps three locally designated corridors. These existing corridors will be the preferred locations for any transmission development that is required to support solar development and future transmission grid improvements related to the build-out of the Dry Lake SEZ. Any use of the corridor lands within the Dry Lake SEZ for solar energy facilities, such as solar panels or heliostats, must be compatible with the future use of the existing corridors. The BLM will assess solar projects in the vicinity of existing corridors on a case-by-case basis. The BLM will review and approve individual project plans of development to ensure compatible development that maintains the use of the corridor.

#### 11.3.2.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on lands and realty are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some mitigation for the identified impacts but will not mitigate all adverse impacts. For example, impacts related to the exclusion of many existing and potential uses of the public land, the visual impact of an industrial-type solar facility within an otherwise rural area, and induced land use changes, if any, on nearby or adjacent state and private lands may not be fully mitigated.

No SEZ-specific design features for lands and realty have been identified through this Final Solar PEIS. Some SEZ-specific design features may be established for parcels within the Dry Lake SEZ through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.3.3 Specially Designated Areas and Lands with Wilderness Characteristics

#### 11.3.3.1 Affected Environment

The description in the Draft Solar PEIS is still accurate with some small changes in the distance of specially designated areas from the revised SEZ boundary. The major exception to this is for Arrow Canyon Wilderness, which would now be about 10 mi (16 km) from the SEZ boundary. In addition, the distance to the Old Spanish National Historic Trail has increased to about 2.1 mi (3.4 km), in comparison to the 1.3 mi (2.1 km) presented in the Draft Solar PEIS.

#### 11.3.3.2 Impacts

Impacts on specially designated areas would be the same as those described in the Draft Solar PEIS with the exception of Arrow Canyon Wilderness. Because of the additional distance between Arrow Canyon Wilderness and the SEZ boundary, it is now anticipated that there would be minimal impact on wilderness characteristics. The distance between the SEZ and the Old Spanish National Historic Trail has also increased somewhat and may result in slightly less impact on the historical setting of the high-potential segment of the Trail. Impacts of solar energy facilities will differ depending on the technologies being installed, with taller facilities having relatively more impact than shorter facilities.

#### 11.3.3.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on specially designated areas are described in Section A.2.2 of Appendix A of this Final Solar PEIS (design features for specially designated areas, cultural resources, and visual resources would address impacts). Implementing the programmatic design features will provide some mitigation for adverse impacts on wilderness characteristics and possibly recreational use of the identified areas. Programmatic design features will be applied to address SEZ-specific resources and conditions, for example:

- For projects in the Dry Lake SEZ which are located within the viewshed of the Old Spanish National Historic Trail, a National Trail inventory will be required to determine the area of possible adverse impact on resources, qualities, values, and associated settings of the trail; to prevent substantial interference; and to determine any areas unsuitable for development. Residual impacts will be avoided, minimized, and/or mitigated to the extent practicable according to program policy standards. Programmatic design features have been included in BLM's Solar Energy Program to address impacts on National Historic Trails (see Section A.2.2.23 of Appendix A).

No SEZ-specific design features for specially designated areas have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.3.4 Rangeland Resources

#### 11.3.4.1 Livestock Grazing

##### *11.3.4.1.1 Affected Environment*

As presented in the Draft Solar PEIS, there are no active grazing allotments in the proposed Dry Lake SEZ. The revised area of the SEZ does not alter this finding.

##### *11.3.4.1.2 Impacts*

Because the SEZ does not contain any active grazing allotments, solar energy development within the SEZ would have no impact on livestock and grazing.

##### *11.3.4.1.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Because the SEZ does not contain any active grazing allotments, no SEZ-specific design features to protect livestock grazing have been identified in this Final Solar PEIS.

#### 11.3.4.2 Wild Horses and Burros

##### *11.3.4.2.1 Affected Environment*

As presented in Section 11.3.4.2.1 of the Draft Solar PEIS, no wild horse or burro herd management areas occur within the proposed Dry Lake SEZ or in close proximity to it. The reconfiguration of the SEZ does not alter this finding.

##### *11.3.4.2.2 Impacts*

As presented in the Draft Solar PEIS, solar energy development within the proposed Dry Lake SEZ would not affect wild horses and burros. Development within the revised area of the Dry Lake SEZ would not alter this conclusion.

##### *11.3.4.2.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Because solar energy development within the proposed Dry Lake SEZ would not affect wild horses and burros, no SEZ-specific design features to address wild horses and burros have been identified in this Final Solar PEIS.

## 11.3.5 Recreation

### 11.3.5.1 Affected Environment

The discussion of recreation use of the proposed SEZ in the Draft Solar PEIS was focused on the northern portion of the SEZ that has been dropped from further consideration. The proposed boundaries of the revised area contain the more developed portions of the SEZ, and this area offers very little in the way of recreation opportunities. Some roads and trails are designated for vehicle use in the area, but their most important function is thought to be providing access to areas to the north that are now outside of the SEZ boundary. Other than road use, there is little sign of recreation activity in the area.

### 11.3.5.2 Impacts

The impacts on recreation stated in the Draft Solar PEIS are still generally accurate, although there are fewer roads and trails within the revised SEZ boundary that would be closed. Closing of roads could adversely affect access to undeveloped areas within the SEZ and areas outside the SEZ.

In addition, lands that are outside of the proposed SEZ may be acquired or managed for mitigation of impacts on other resources (e.g., sensitive species). Managing these lands for mitigation could further exclude or restrict recreational use, potentially leading to additional losses in recreational opportunities in the region. The impact of acquisition and management of mitigation lands would be considered as a part of the environmental analysis of specific solar energy projects.

### 11.3.5.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on recreational resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS (design features for both specially designated areas and visual resources also would address some impacts). Implementing the programmatic design features for visual impacts will help minimize the impacts of individual solar projects. Implementing the programmatic design features for recreation will mitigate the loss of road access to surrounding areas but not mitigate the loss of recreational access to public lands developed for solar energy production or the loss of wildlife-related hunting recreation.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features to address recreation impacts have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.3.6 Military and Civilian Aviation

#### 11.3.6.1 Affected Environment

The proposed Dry Lake SEZ as revised is not located under any military airspace, nor is it identified as a DoD Consultation Area in BLM land records. It is located about 13.5 mi (22 km) northeast of Nellis Air Force Base, one of the largest fighter bases in the world. While not located under designated military airspace, the area is close to airspace that is used for military aircraft approaches and departures from Nellis. Data provided in the Draft Solar PEIS remain valid.

#### 11.3.6.2 Impacts

Nellis Air Force Base Command has continued to express concerns over potential impacts on the approach and departure of aircraft from the base from solar energy facilities that might be located in the SEZ. The NTTR has also indicated that facilities taller than 50 ft (15 m) may interfere with testing activities at the NTTR. It is not clear whether the reduction in size of the proposed SEZ will mitigate any of these concerns.

#### 11.3.6.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on military and civilian aviation are described in Section A.2.2 of Appendix A of this Final Solar PEIS. The programmatic design features require early coordination with the DoD to identify and avoid, minimize, and/or mitigate, if possible, potential impacts on the use of military airspace.

No SEZ-specific design features for military and civilian aviation have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.3.7 Geologic Setting and Soil Resources

#### 11.3.7.1 Affected Environment

##### *11.3.7.1.1 Geologic Setting*

Data provided in the Draft Solar PEIS remain valid, with the following update:

- The terrain of the proposed Dry Lake SEZ is relatively flat (Figure 11.3.7.1-1). The boundaries of the proposed SEZ have been

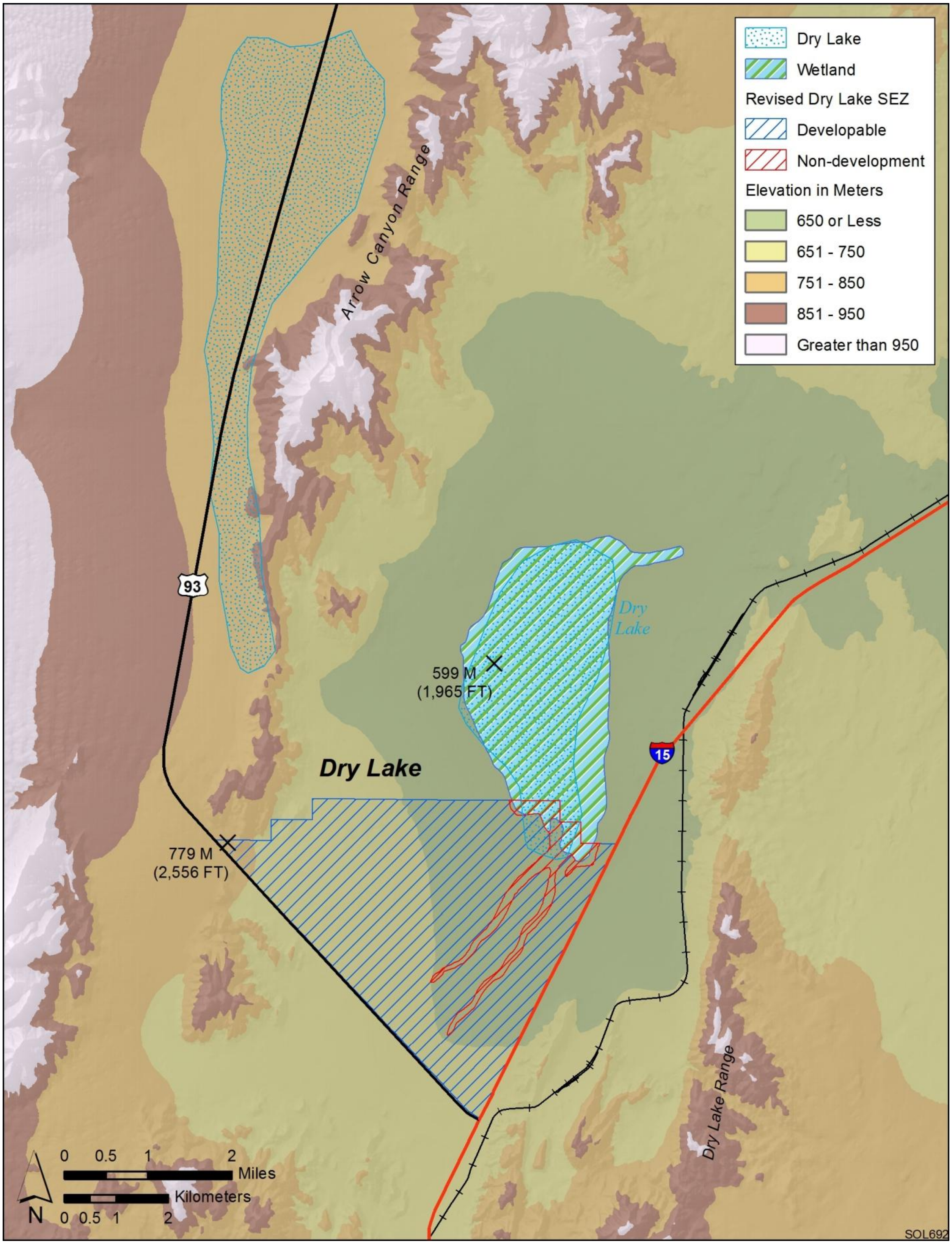


**FIGURE 11.3.7.1-1 General Terrain of the Proposed Dry Lake SEZ as Revised**

changed to exclude the northern portion of the SEZ. Within the revised area, 469 acres (1.9 km$^2$) of floodplain and wetland have been designated as non-development areas. On the basis of these changes, the elevations range from about 2,560 ft (780 m) at the northwest corner to about 2,000 ft (610 m) at the northeast corner.

#### *11.3.7.1.2 Soil Resources*

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- Soils within the proposed Dry Lake SEZ as revised are predominantly very gravelly and stony loams of the Colorock–Tonopah and Bard–Tonopah associations, which now make up about 95% of the soil coverage at the site (Table 11.3.7.1-1).

- Soil unit coverage at the proposed Dry Lake SEZ as revised is shown in Figure 11.3.7.1-2. The designation of new SEZ boundaries and non-development areas eliminate 4,713 acres (19 km$^2$) of the Colorock–Tonopah association, 15 acres (0.061 km$^2$) of the Bard–Tonopah association, 1,546 acres (6.3 km$^2$) (all) of the Bard very stony loam, 1,189 acres (4.8 km$^2$) of the Bard gravelly fine sandy loam, 724 acres (2.9 km$^2$) of the Ireteba loam-overflow, 516 acres (2.1 km$^2$) (all) of the Ireteba loam, 415 acres (1.7 km$^2$) (all) of the Grapevine loam, 226 acres (0.91 km$^2$) of the Rock land–St. Thomas association, 195 acres (0.79 km$^2$) (all) playas, and 116 acres (0.47 km$^2$) (all) of the Bard very gravelly fine sandy loam.

### 11.3.7.2 Impacts

Impacts on soil resources would occur mainly as a result of ground-disturbing activities (e.g., grading, excavating, and drilling), especially during the construction phase of a solar project. Because impacts on soil resources result from ground-disturbing activities in the project area, soil impacts would be roughly proportional to the size of a given solar facility, with larger areas of disturbed soil having a greater potential for impacts than smaller areas (Section 5.7.2). The assessment provided in the Draft Solar PEIS remains valid, with the following updates:

- Impacts related to wind erodibility are reduced because the identification of new SEZ boundaries and non-development areas eliminates 9,429 acres (38 km$^2$) of moderately erodible soils, including 195 acres (0.79 km$^2$) of playas, from development.

- Impacts related to water erodibility are reduced because the new SEZ boundaries eliminate 610 acres (2.5 km$^2$) of moderately erodible soils, including 195 acres (0.79 km$^2$) of playas, from development.

**TABLE 11.3.7.1-1 Summary of Soil Map Units within the Proposed Dry Lake SEZ as Revised**

| Map Unit Symbol | Map Unit Name | Erosion Potential: Water[a] | Erosion Potential: Wind[b] | Description | Area, in Acres[c] (percentage of SEZ) |
|---|---|---|---|---|---|
| CTC | Colorock–Tonopah association, moderately sloping (2 to 8% slopes) | Slight (0.24) | Moderate (WEG 6)[d] | Consists of about 55% Colorock very gravelly clay loam and 40% Tonopah gravelly sandy loam. Nearly level to gently sloping soils on fan remnants. Parent material is calcareous alluvium derived from sedimentary rock. Deep and well to excessively drained, with high surface runoff potential (very slow infiltration rate) and moderate permeability. Available water capacity is low. Moderate rutting hazard. Colorock soils have well-developed pavements. Used mainly as rangeland, forestland, or wildlife habitat; unsuitable for cultivation. | 4,064 (65.7)[e] |
| BRB | Bard–Tonopah association, gently sloping | Slight (0.28) | Moderate (WEG 5) | Consists of about 60% Bard gravelly fine sandy loam and 30% Tonopah gravelly sandy loam. Gently sloping soils on fan remnants. Parent material is alluvium derived from limestone and dolomite. Shallow and deep, well to excessively drained, with high surface runoff potential (very slow infiltration rate) and moderate permeability. Available water capacity is very low. Moderate rutting hazard. Used mainly as rangeland, forestland, or wildlife habitat; unsuitable for cultivation. | 1,799 (21.9)[f] |
| BHC | Bard gravelly fine sandy loam (2 to 8% slopes) | Slight (0.20) | Moderate (WEG 4) | Nearly level to gently sloping soils on fan remnants. Parent material consists of alluvium derived from limestone and dolomite. Moderately deep and well drained, with high surface runoff potential (very slow infiltration rate) and high permeability. Available water capacity is very low. Moderate rutting hazard. Used mainly as rangeland, forestland, or wildlife habitat; unsuitable for cultivation. | 160 (2.6) |
| It | Ireteba loam, overflow | Slight (0.28) | Moderate (WEG 4) | Nearly level soils formed on floodplains. Parent material consists of alluvium derived from mixed sources. Moderately deep and well drained, with moderate surface runoff potential and moderate permeability Low resistance to compaction. Available water capacity is high. Severe rutting hazard. Used mainly as rangeland, forestland, or wildlife habitat; unsuitable for cultivation. | 130 (2.1)[g] |

**TABLE 11.3.7.1-1 (Cont.)**

| Map Unit Symbol | Map Unit Name | Erosion Potential: Water[a] | Erosion Potential: Wind[b] | Description | Area, in Acres[c] (percentage of SEZ) |
|---|---|---|---|---|---|
| RTF | Rock land–St. Thomas association, very steep | Not rated | Not rated | Consists of about 60% rockland and 30% St. Thomas. Steeply sloping soils on mountain slopes. Parent material is colluvium derived from limestone and dolomite over residuum weathered from limestone and dolomite. Shrink-swell potential is low. Available water capacity is very low. Used mainly as rangeland, forestland, or wildlife habitat; unsuitable for cultivation. | 34 (<1) |

[a] Water erosion potential rates based on soil erosion factor K, which indicates the susceptibility of soil to sheet and rill erosion by water. Values range from 0.02 to 0.69 and are provided in parentheses under the general rating; a higher value indicates a higher susceptibility to erosion. Estimates based on the percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity. A rating of “slight” indicates that erosion is unlikely under ordinary climatic conditions.

[b] Wind erosion potential here is based on the wind erodibility group (WEG) designation: groups 1 and 2, high; groups 3 through 6, moderate; and groups 7 and 8, low (see footnote d for further explanation).

[c] To convert acres to km$^2$, multiply by 0.004047.

[d] WEGs are based on soil texture, content of organic matter, effervescence of carbonates, content of rock fragments, and mineralogy, and also take into account soil moisture, surface cover, soil surface roughness, wind velocity and direction, and the length of unsheltered distance (USDA 2004). Groups range in value from 1 (most susceptible to wind erosion) to 8 (least susceptible to wind erosion). The NRCS provides a wind erodibility index, expressed as an erosion rate in tons per acre per year, for each of the wind erodibility groups: WEG 1, 220 tons (200 metric tons) per acre (4,000 m$^2$) per year (average); WEG 2, 134 tons (122 metric tons) per acre (4,000 m$^2$) per year; WEGs 3 and 4 (and 4L), 86 tons (78 metric tons) per acre (4,000 m$^2$) per year; WEG 5, 56 tons (51 metric tons) per acre (4,000 m$^2$) per year; WEG 6, 48 tons (44 metric tons) per acre (4,000 m$^2$) per year; WEG 7, 38 tons (34 metric tons) per acre (4,000 m$^2$) per year; and WEG 8, 0 tons (0 metric tons) per acre (4,000 m$^2$) per year.

[e] A total of 47 acres (0.19 km$^2$) within the Colorock–Tonopah association is currently categorized as a non-development area (denoted by red areas in Figure 11.3.7.1-2).

[f] A total of 298 acres (1.2 km$^2$) within the Bard–Tonopah association is currently categorized as a non-development area (denoted by red areas in Figure 11.3.7.1-2).

[g] A total of 124 acres (0.50 km$^2$) within the Ireteba loam, overflow is currently categorized as a non-development area (denoted by red areas in Figure 11.3.7.1-2).

Source: NRCS (2010).

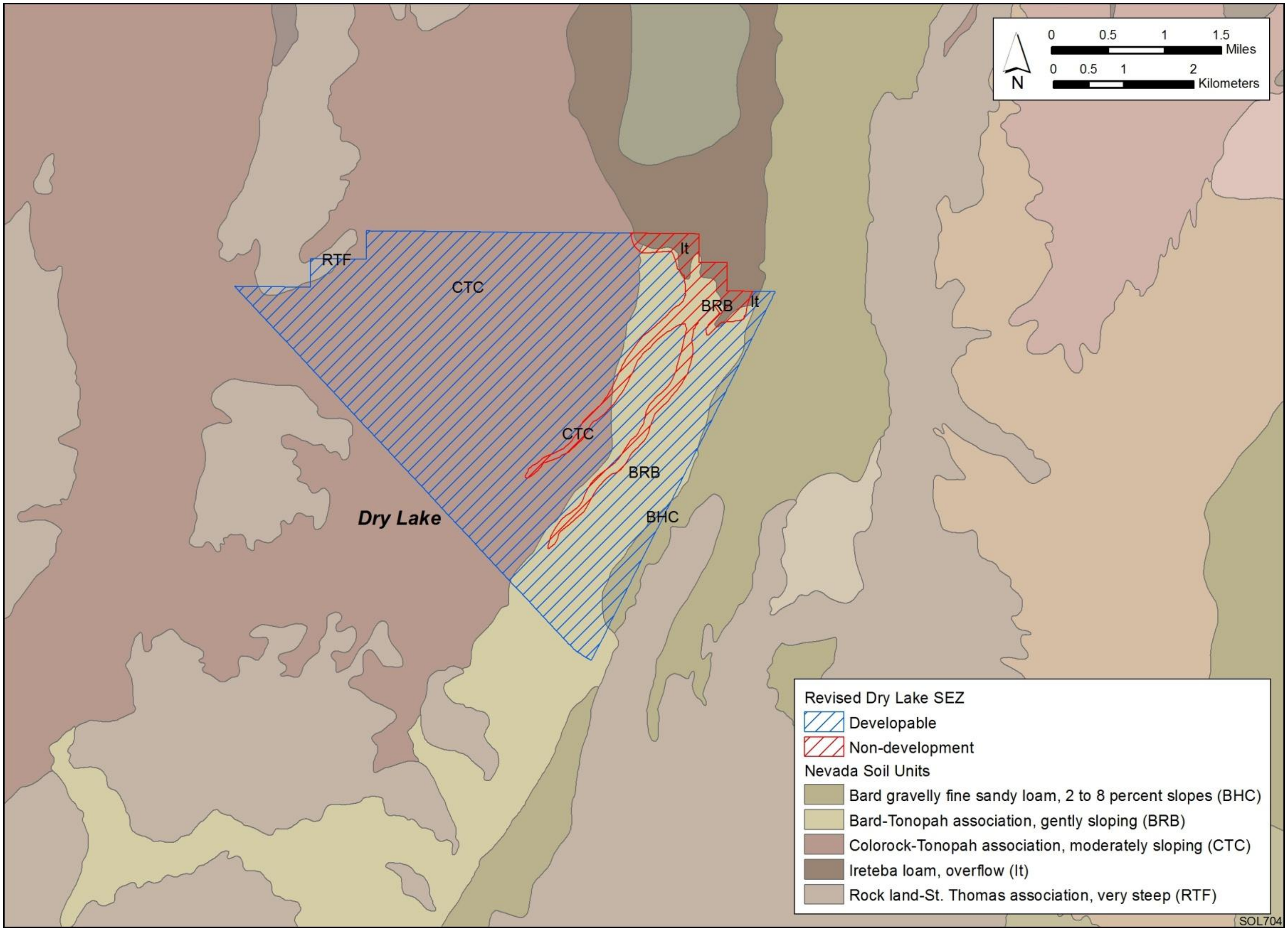


**FIGURE 11.3.7.1-2  Soil Map for the Proposed Dry Lake SEZ as Revised (NRCS 2008)**

#### 11.3.7.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on soils are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will reduce the potential for soil impacts during all project phases.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for soil resources have been identified at the proposed Dry Lake SEZ. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.3.8 Minerals (Fluids, Solids, and Geothermal Resources)

A mineral potential assessment for the proposed Dry Lake SEZ has been prepared and reviewed by BLM mineral specialists knowledgeable about the region where the SEZ is located (BLM 2012a). The BLM is proposing to withdraw the SEZ from settlement, sale, location, or entry under the general land laws, including the mining laws, for a period of 20 years (see Section 2.2.2.2.4 of this Final Solar PEIS). The potential impacts of this withdrawal are discussed in Section 13.3.24.

#### 11.3.8.1 Affected Environment

The active mining claims on two sections of the SEZ discussed in the Draft Solar PEIS are located within the revised SEZ. The mineral processing plant is also still within the SEZ. Data provided in the Draft Solar PEIS remain valid.

#### 11.3.8.2 Impacts

The existing mining claims in the proposed SEZ are prior existing rights and, if they are valid, would likely preclude solar development within the claimed areas. This portion of the SEZ is also encumbered with numerous ROWs, so it is not likely to be utilized for solar development.

#### 11.3.8.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on mineral resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide adequate protection of mineral resources.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for minerals have been identified in this Final Solar

PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.3.9 Water Resources

### 11.3.9.1 Affected Environment

The overall size of the Dry Lake SEZ has been reduced by 60% from the area described in the Draft Solar PEIS, resulting in a total area of 6,186 acres (25 $km^2$). The description of the affected environment given in the Draft Solar PEIS relevant to water resources at the proposed Dry Lake SEZ remains valid and is summarized in the following paragraphs.

The Dry Lake SEZ is within the Lower Colorado–Lake Mead subbasin of the Lower Colorado River Basin hydrologic region. The SEZ is located in Garnet Valley (also called Dry Lake Valley), surrounded by the Arrow Canyon Range to the west and the Dry Lake Range to the southeast. The average precipitation is about 5 in./yr (13 cm/yr), and the estimated pan evaporation rate is approximately 99 in./yr (251 cm/yr). There are no perennial surface water features in the SEZ. Dry Lake is adjacent to the northeastern boundary of the SEZ with 469 acres (1.9 $km^2$) of the dry lake and associated intermittent/ephemeral channels within the SEZ being identified as non-development areas. The revised SEZ boundaries lie outside the 100-year and 500-year floodplain areas associated with Dry Lake. The proposed Dry Lake SEZ is part of the Garnet Valley groundwater basin, a basin-fill aquifer covering approximately 342,400 acres (1,386 $km^2$). The basin-fill aquifer consists of unconfined alluvium and lacustrine deposits of sand, silt, and clay, with an average thickness of around 600 ft (183 m). Regional-scale carbonate rock aquifers underlay the basin-fill aquifers in Garnet Valley. These carbonate rock aquifers are a part of the White River Groundwater Flow System (a subunit of the Colorado River groundwater system), a regional-scale groundwater system that generally flows southward and terminates at Muddy River Springs, Rogers and Blue Point Springs, and the Virgin River. Estimates of groundwater recharge are approximately 800 ac-ft/yr (990,000 $m^3$/yr), groundwater elevations are approximately between 230 and 760 ft (70 and 230 m), and groundwater flows from the west to the east in the vicinity of the SEZ. Groundwater quality varies in Garnet Valley, but concentrations of TDS, sulfate, iron, fluoride, manganese, and radon-222 have all been recorded at higher than the MCLs in the area surrounding the SEZ.

All waters in Nevada are public property and the NDWR is the agency responsible for managing both surface and groundwater resources. The Garnett Valley groundwater basin is a designated groundwater basin, and preferred uses of groundwater include municipal, quasi-municipal, industrial, commercial, mining, stockwater, and wildlife purposes, set up to specifically exclude irrigation. The perennial yield for Garnett Valley is set at 400 ac-ft/yr (490,000 $m^3$/yr), and the basin is currently overappropriated, with approximately 3,400 ac-ft/yr (4.2 million $m^3$/yr) committed for beneficial uses. An additional 44,500 ac-ft/yr (55 million $m^3$/yr) of water right applications are held in abeyance, and no new water right applications are being accepted according to State Engineer's Order 1169 (NDWR 2002), which calls for further studies on potential impacts from groundwater pumping in Garnett Valley, and several other adjacent valleys, on regional-scale groundwater conditions in the carbonate rock aquifers. Solar developers would most likely have to purchase and transfer existing water rights in Garnett Valley, which may be difficult given the overallocated state of the basin and the number of competing water rights being held in abeyance.

In addition to the water resources information provided in the Draft Solar PEIS, this section provides a planning-level inventory of available climate, surface water, and groundwater monitoring stations within the immediate vicinity of the Dry Lake SEZ and surrounding basin. Additional data regarding climate, surface water, and groundwater conditions are presented in Tables 11.3.9.1-1 through 11.3.9.1-7 and in Figures 11.3.9.1-1 and 11.3.9.1-2. Fieldwork and hydrologic analyses to determine jurisdictional water bodies would need to be coordinated with appropriate federal, state, and local agencies. Areas within the Dry Lake SEZ that are determined to be jurisdictional will be subject to the permitting process described in the CWA.

### 11.3.9.2 Impacts

#### *11.3.9.2.1 Land Disturbance Impacts on Water Resources*

The discussion of land disturbance effects on water resources in the Draft Solar PEIS remains valid. As stated in the Draft Solar PEIS, land disturbance impacts in the vicinity of the proposed Dry Lake SEZ could potentially affect drainage patterns, along with groundwater recharge and discharge properties. The alteration of natural drainage pathways during construction can lead to impacts related to flooding, loss of water delivery to downstream regions, and alterations to riparian vegetation and habitats. The alteration of the SEZ boundaries to exclude the 100-year floodplain area that included Dry Lake and two intermittent/ephemeral streams reduces the potential for adverse impacts associated with land disturbance activities.

**TABLE 11.3.9.1-1 Watershed and Water Management Basin Information Relevant to the Proposed Dry Lake SEZ as Revised**

| Basin | Name | Area (acres)[b] |
|---|---|---|
| Subregion (HUC4)[a] | Lower Colorado–Lake Mead (1501) | 19,383,151 |
| Cataloging unit (HUC8) | Muddy (15010012) | 1,159,401 |
| Groundwater basin | Garnet Valley | 101,639 |
| SEZ | Dry Lake SEZ | 6,186 |

[a] HUC = Hydrologic Unit Code; a USGS system for characterizing nested watersheds that includes large-scale subregions (HUC4) and small-scale cataloging units (HUC8).

[b] To convert acres to $km^2$, multiply by 0.004047.

**TABLE 11.3.9.1-2 Climate Station Information Relevant to the Proposed Dry Lake SEZ as Revised**

| Climate Station (COOP ID[a]) | Elevation[b] (ft)[c] | Distance to SEZ (mi)[d] | Period of Record | Mean Annual Precipitation (in.)[e] | Mean Annual Snowfall (in.) |
|---|---|---|---|---|---|
| Desert Game Range, Nevada (262243) | 2,920 | 26 | 1940–2011 | 4.50 | 0.70 |
| Las Vegas NWFO, Nevada (264439) | 1,898 | 17 | 1996–2011 | 4.94 | 0.40 |
| Overton, Nevada (265846) | 1,250 | 26 | 1939–2011 | 4.71 | 0.20 |
| Sunrise Manor Las Vegas, Nevada (267925) | 1,821 | 18 | 1961–1989 | 4.28 | 0.60 |
| Valley of Fire State Park, Nevada (268588) | 2,000 | 21 | 1972–2011 | 6.54 | 0.30 |

[a] National Weather Service's Cooperative Station Network station identification code.

[b] Surface elevations for the proposed Dry Lake SEZ range from 1,970 to 2,560 ft.

[c] To convert ft to m, multiply by 0.3048.

[d] To convert mi to km, multiply by 1.6093.

[e] To convert in. to cm, multiply by 2.540.

Source: NOAA (2012).

**TABLE 11.3.9.1-3 Total Lengths of Selected Streams at the Subregion, Cataloging Unit, and SEZ Scale Relevant to the Proposed Dry Lake SEZ as Revised**

| Water Feature | Subregion, HUC4 (ft)[a] | Cataloging Unit, HUC8 (ft) | SEZ (ft) |
|---|---|---|---|
| Unclassified streams | 77,194 | 9,320 | 0 |
| Perennial streams | 6,478,881 | 155,849 | 0 |
| Intermittent/ephemeral streams | 440,786,248 | 24,271,247 | 108,169 |
| Canals | 1,380,645 | 125,983 | 0 |

[a] To convert ft to m, multiply by 0.3048.

Source: USGS (2012a).

**TABLE 11.3.9.1-4 Stream Discharge Information Relevant to the Proposed Dry Lake SEZ as Revised**

| | Station (USGS ID) | |
|---|---|---|
| Parameter | Dry Lake Tributary near Nellis Air Force Base, Nevada (09417100) | Muddy River at Lewis Avenue at Overton, Nevada (09419507) |
| Period of record | 1964–1975 | 1998–2010 |
| No. of observations | 12 | 10 |
| Discharge, median ($ft^3/s$)[a] | 0 | 94 |
| Discharge, range ($ft^3/s$) | 0–180 | 30–1,300 |
| Discharge, most recent observation ($ft^3/s$) | 4 | 83 |
| Distance to SEZ (mi)[b] | 4 | 27 |

[a] To convert $ft^3$ to $m^3$, multiply by 0.0283.

[b] To convert mi to km, multiply by 1.6093.

Source: USGS (2012b).

Land clearing, land leveling, and vegetation removal during the development of the SEZ have the potential to disrupt intermittent/ephemeral stream channels. Several programmatic design features described in Section A.2.2 of Appendix A of this Final Solar PEIS would avoid, minimize, and/or mitigate impacts associated with the disruption of intermittent/ephemeral water features. Additional analyses of intermittent/ephemeral streams are presented in this update, including an evaluation of functional aspects of stream channels with respect to groundwater recharge, flood conveyance, sediment transport, geomorphology, and ecological habitats. Only a summary of the results from these surface water analyses is presented in this section; more information on methods and results is presented in Appendix O.

**TABLE 11.3.9.1-5  Surface Water Quality Data Relevant to the Proposed Dry Lake SEZ as Revised**

| | Station (USGS ID)[a] | |
|---|---|---|
| Parameter | 362718114503801 | 09419507 |
| Period of record | 1985 | 2001–2009 |
| No. of records | 1 | 31 |
| Temperature (°C)[b] | 29 | 20.7 (10.7–25.9) |
| Total dissolved solids (mg/L) | 951 | 1,120 (902–1,360) |
| Dissolved oxygen (mg/L) | 2 | 8.3 (7–10.6) |
| pH | 7.3 | 8.15 (8–8.2) |
| Total nitrogen (mg/L) | <0.100 | 0.32 (0.27–0.97) |
| Phosphorus (mg/L as P) | <0.01 | NA |
| Organic carbon (mg/L) | NA[c] | 3 (2.7–4.2) |
| Calcium (mg/L) | 110 | 109 (79.2–173) |
| Magnesium (mg/L) | 48 | 53.3 (44.1–69.8) |
| Sodium (mg/L) | 120 | 174 (141–219) |
| Chloride (mg/L) | 170 | 116 (100–139) |
| Sulfate (mg/L) | 360 | 432 (359–577) |
| Arsenic (µg/L) | NA | 30.2 (27.7–46.7) |

[a] Median values are listed; the range in values is shown in parentheses.

[b] To convert °C to °F, multiply by 1.8, then add 32.

[c] NA = no data collected for this parameter.

Source: USGS (2012b).

The study region considered for the intermittent/ephemeral stream evaluation relevant to the Dry Lake SEZ is a subset of the watersheds (HUC8) for which information regarding stream channels is presented in Tables 11.3.9.1-3 and 11.3.9.1-4 of this Final Solar PEIS. The results of the intermittent/ephemeral stream evaluation are shown in Figure 11.3.9.2-1, which depicts a subset of flow lines from the National Hydrography Dataset (USGS 2012a) labeled as having a low, moderate, or high sensitivity to land disturbance (Figure 11.3.9.2-1). The analysis indicated that 36% of total length of the intermittent/ephemeral stream channel reaches in the evaluation had low sensitivity, 63% had moderate sensitivity, and 1% had high sensitivity to land disturbance. Several intermittent/ephemeral channels within the SEZ were classified as having moderate sensitivity to land disturbance.

#### *11.3.9.2.2  Water Use Requirements for Solar Energy Technologies*

Changes in the Dry Lake SEZ boundaries resulted in significant changes to the estimated water use requirements during construction and operations. This section presents changes in water use estimates for the reduced SEZ area and additional analyses pertaining to groundwater. The additional analyses of groundwater include a basin-scale groundwater budget and a

**TABLE 11.3.9.1-6 Water Quality Data from Groundwater Samples Relevant to the Proposed Dry Lake SEZ as Revised**

| | Station (USGS ID)[a] | | |
|---|---|---|---|
| Parameter | 362329114541401 | 363308114553001 | 362507114572701 |
| Period of record | 1986 | 1986 | 2003 |
| No. of records | 1 | 1 | 1 |
| Temperature (°C)[b] | 24 | 25 | 27.2 |
| Total dissolved solids (mg/L) | NA[c] | NA | 984 |
| Dissolved oxygen (mg/L) | 4.8 | 3.8 | 1.9 |
| pH | 7.4 | 7.8 | 7.2 |
| Nitrate + nitrite (mg/L as N) | 0.42 | 1.9 | 0.1 |
| Phosphate (mg/L) | < 0.01 | 0.04 | NA |
| Organic carbon (mg/L) | NA | NA | < 0.3 |
| Calcium (mg/L) | 120 | 33 | 111 |
| Magnesium (mg/L) | 47 | 30 | 50.1 |
| Sodium (mg/L) | 140 | 86 | 106 |
| Chloride (mg/L) | 180 | 64 | 154 |
| Sulfate (mg/L) | 370 | 90 | 329 |
| Arsenic (µg/L) | NA | NA | 3.1 |
| Radon-222 (pCi/L) | NA | NA | 26 |

[a] Median values are listed.

[b] To convert °C to °F, multiply by 1.8, then add 32.

[c] NA = no data collected for this parameter.

Source: USGS (2012b).

simplified, one-dimensional groundwater model of potential groundwater drawdown. Only a summary of the results from these groundwater analyses is presented in this section; more information on methods and results is presented in Appendix O.

Table 11.3.9.2-1 presents the revised estimates of water requirements for both construction and operation of solar facilities at the proposed Dry Lake SEZ assuming full build-out of the SEZ and accounting for its decreased size. A basin-scale groundwater budget was assembled using available data on groundwater inputs, outputs, and storage, with results presented in Table 11.3.9.2-2.

The estimated total water use requirements during the peak construction year are as high as 1,740 ac-ft/yr (2.1 million $m^3$/yr), which is more than two times the estimated annual inputs to the basin and is on par with the current groundwater withdrawals in the Garnet Valley Basin. Given the short duration of construction activities, the water use estimate for construction is not a primary concern to water resources in the basin. The long duration of groundwater pumping during operations (20 years) poses a greater threat to groundwater resources. This analysis considered low, medium, and high groundwater pumping scenarios that represent full build-out

**TABLE 11.3.9.1-7 Groundwater Surface Elevations Relevant to the Proposed Dry Lake SEZ as Revised**

| Parameter | Station (USGS ID) | | | |
|---|---|---|---|---|
| | 362318114545801 | 362329114541401 | 362417114525601 | 362531114524201 |
| Period of record | 1963–1990 | 1971 | 1985 | 1956 |
| No. of observations | 3 | 1 | 1 | 1 |
| Surface elevation (ft)[a] | 2,211 | 2,170 | 2,200 | 2,045 |
| Well depth (ft) | 300 | 500 | NA[d] | 793 |
| Depth to water, median (ft) | 233 | 338 | 392 | 226 |
| Depth to water, range (ft) | 230–250 | –[c] | – | – |
| Depth to water, most recent observation (ft) | 250 | 338 | 391.94 | 226.4 |
| Distance to SEZ (mi)[b] | 2 | 2 | 1 | 1 |

[a] To convert ft to m, multiply by 0.3048.

[b] To convert mi to km, multiply by 1.6093.

[c] A dash indicates only one data point at this site.

[d] NA = data not available.

Source: USGS (2012b).

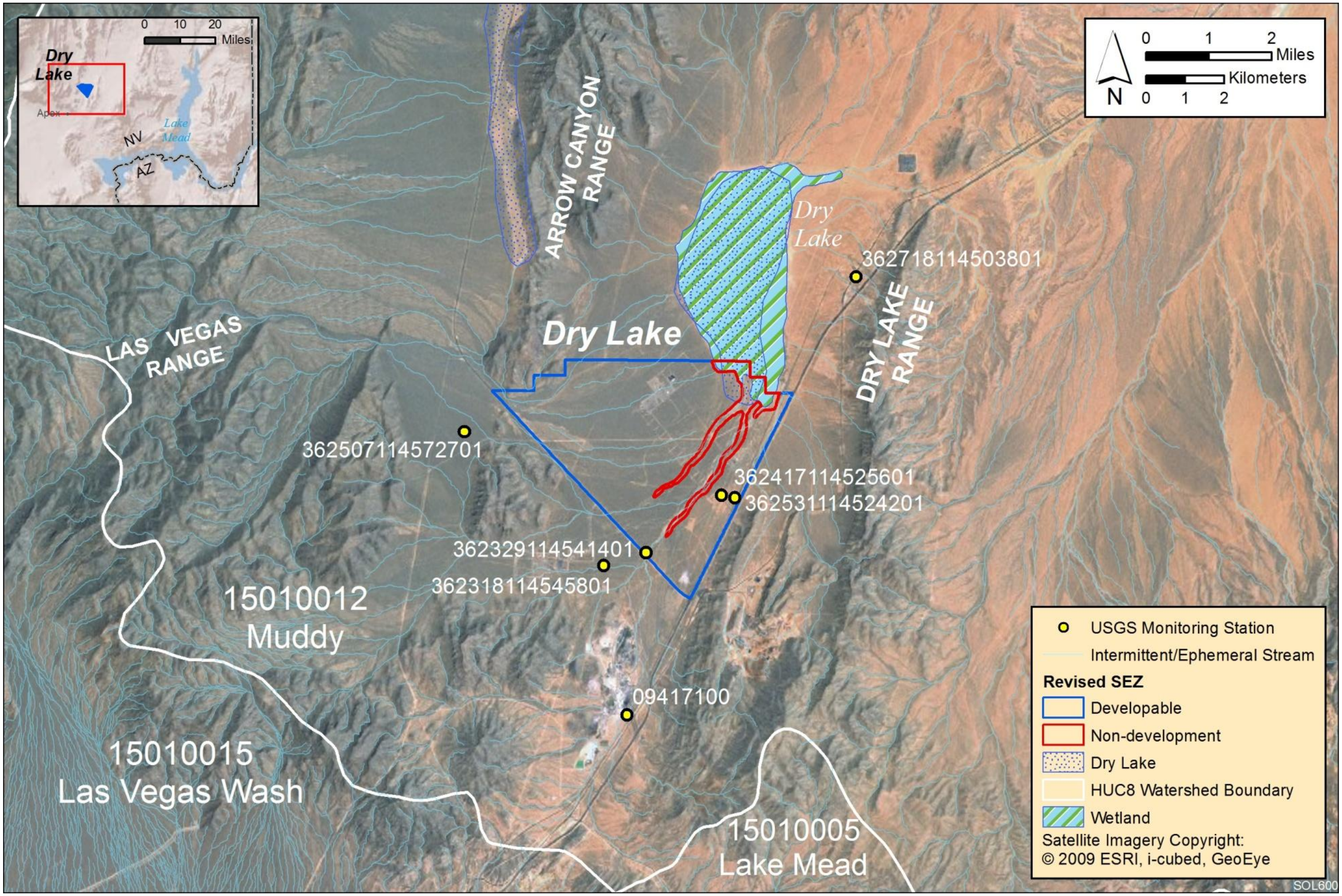


**FIGURE 11.3.9.1-1 Water Features near the Proposed Dry Lake SEZ as Revised**

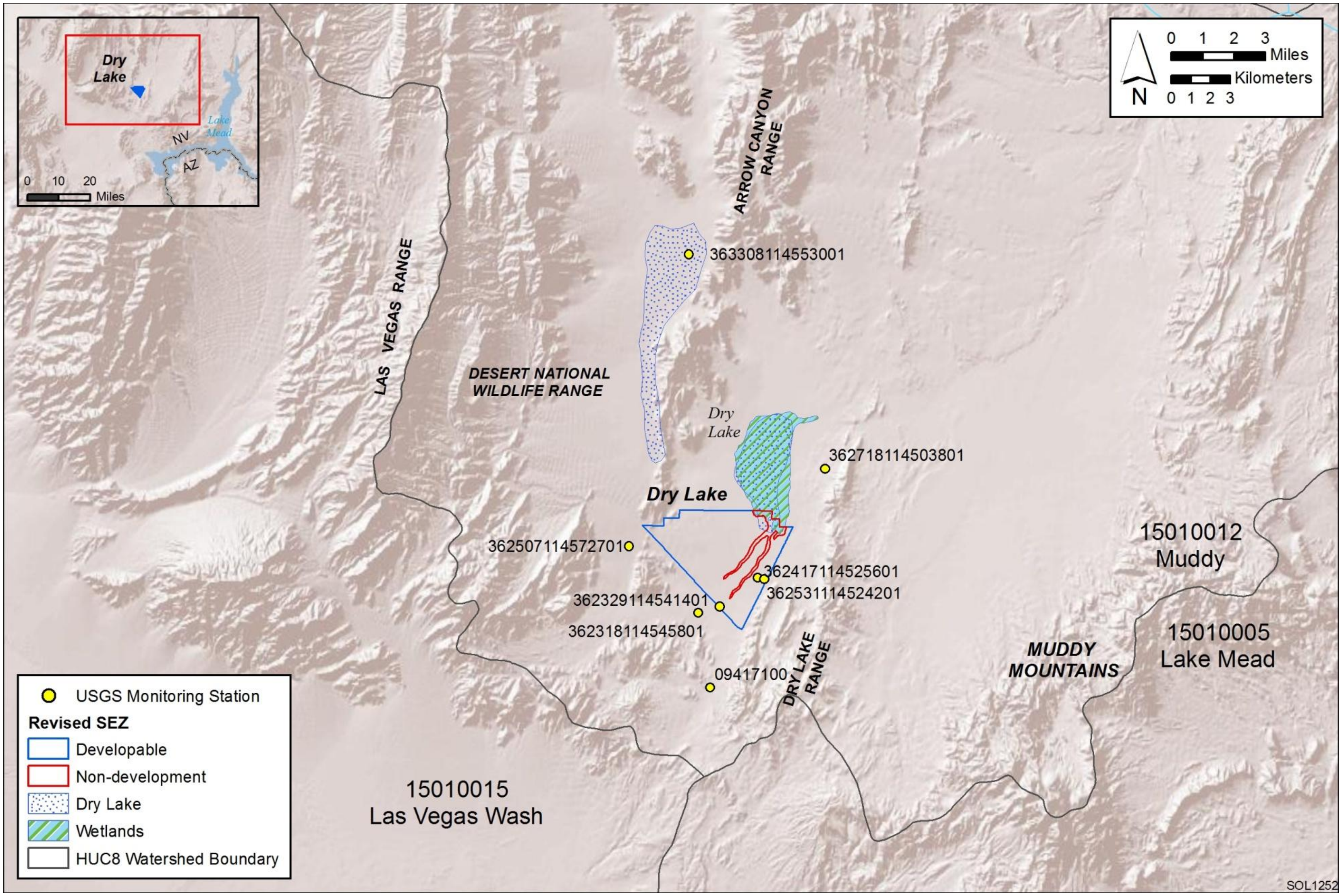


**FIGURE 11.3.9.1-2 Water Features within the Muddy River Watershed, Which Includes the Proposed Dry Lake SEZ as Revised**

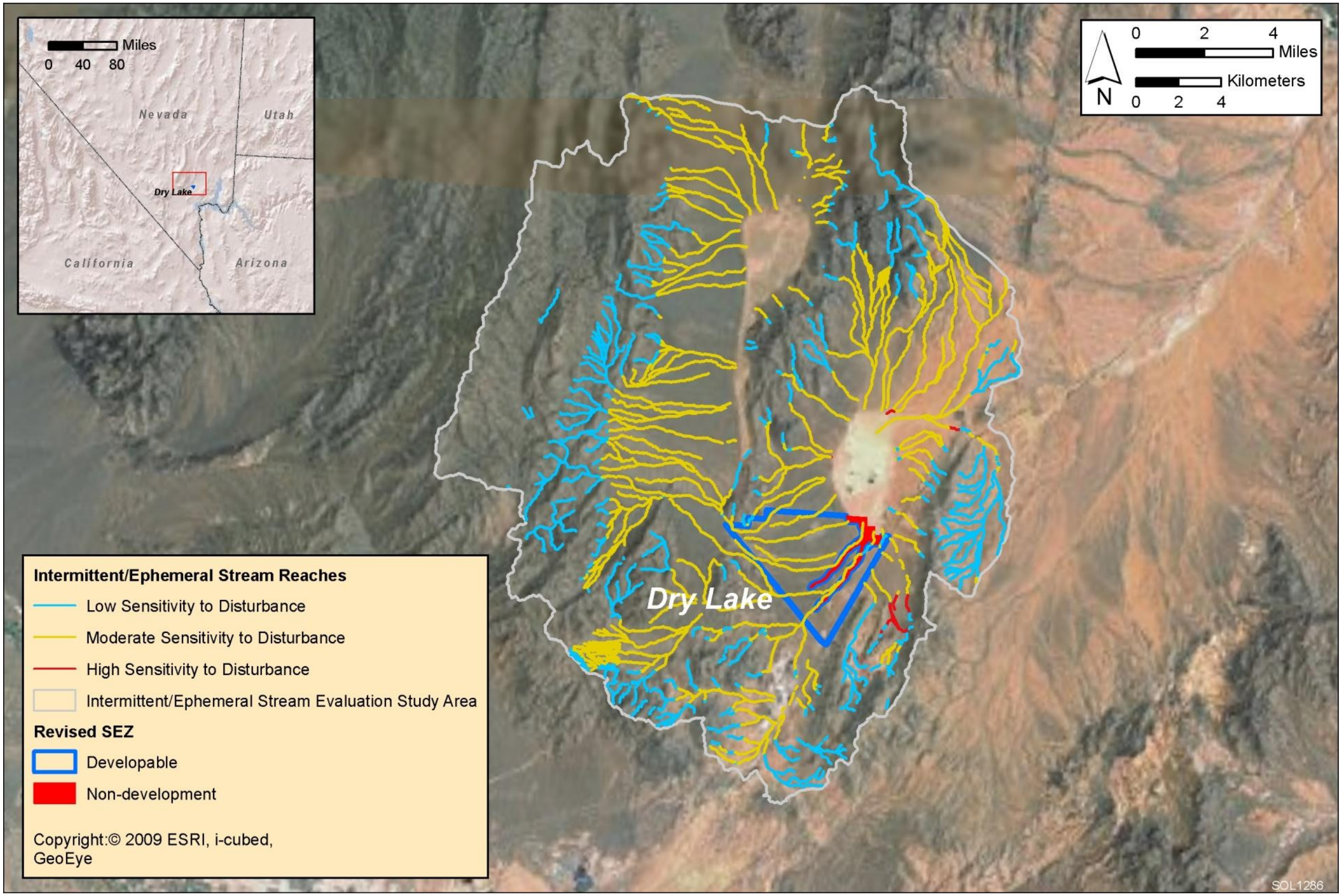


**FIGURE 11.3.9.2-1 Intermittent/Ephemeral Stream Channel Sensitivity to Surface Disturbances in the Vicinity of the Proposed Dry Lake SEZ as Revised**

**TABLE 11.3.9.2-1 Estimated Water Requirements for the Proposed Dry Lake SEZ as Revised[a]**

| Activity | Parabolic Trough | Power Tower | Dish Engine | PV |
|---|---|---|---|---|
| **Construction—Peak Year** | | | | |
| *Water use requirements* | | | | |
| Fugitive dust control (ac-ft)[b] | 1,130 | 1,695 | 1,695 | 1,695 |
| Potable supply for workforce (ac-ft) | 74 | 45 | 19 | 9 |
| Total water use requirements (ac-ft) | 1,204 | 1,740 | 1,714 | 1,704 |
| *Wastewater generated* | | | | |
| Sanitary wastewater (ac-ft) | 74 | 45 | 19 | 9 |
| **Operations** | | | | |
| *Water use requirements* | | | | |
| Mirror/panel washing (ac-ft/yr) | 457 | 254 | 254 | 25 |
| Potable supply for workforce (ac-ft/yr) | 13 | 6 | 6 | <1 |
| Dry cooling (ac-ft/yr) | 183–915 | 102–508 | NA | NA |
| Wet cooling (ac-ft/yr) | 4,116–13,263 | 2,287–7,369 | NA | NA |
| *Total water use requirements* | | | | |
| Non-cooled technologies (ac-ft/yr) | NA[c] | NA | 260 | 25 |
| Dry-cooled technologies (ac-ft/yr) | 653–1,385 | 362–768 | NA | NA |
| Wet-cooled technologies (ac-ft/yr) | 4,586–13,733 | 2,547–7,629 | NA | NA |
| *Wastewater generated* | | | | |
| Blowdown (ac-ft/yr) | 260 | 144 | NA | NA |
| Sanitary wastewater (ac-ft/yr) | 13 | 6 | 6 | <1 |

[a] See Section M.9.2 of Appendix M of the Draft Solar PEIS for methods used in estimating water use requirements.

[b] To convert ac-ft to $m^3$, multiply by 1,234.

[c] NA = not applicable.

of the SEZ assuming PV, dry-cooled parabolic trough, and wet-cooled parabolic trough, respectively (a 30% operational time was considered for all the solar facility types on the basis of operations estimates for recently proposed utility-scale solar energy facilities).

The low, medium, and high pumping scenarios result in groundwater withdrawals that range from 26 to 4,586 ac-ft/yr (0.032 to 5.7 million $m^3$/yr), or 520 to 91,720 ac-ft (0.64 to 113 million $m^3$) over the 20-year operational period. From a groundwater budgeting perspective, the high pumping scenario would represent 5.7 times the estimated total annual groundwater inputs to the basin and more than 9% of the estimated groundwater storage in the Garnet Valley Basin over the 20-year operational period. In addition, the average annual groundwater outputs from the basin can be more than 2 times the groundwater inputs to the basin. The low and medium pumping scenarios have annual withdrawals that represent 3% and 82%, respectively,

**TABLE 11.3.9.2-2 Groundwater Budget for the Garnet Valley Groundwater Basin, Which Includes the Proposed Dry Lake SEZ as Revised**

| Process | Amount |
|---|---|
| *Inputs* | |
| Recharge (ac-ft/yr)[a,b] | 400 |
| Underflow from Hidden Valley (ac-ft/yr) | 400 |
| *Outputs* | |
| Underflow to California Wash basin (ac-ft/yr) | 800 |
| Total withdrawals (ac-ft/yr) | 800–1,600[c] |
| *Storage* | |
| Aquifer storage (ac-ft) | 1,000,000[d] |
| Perennial yield (ac-ft/yr) | 400[e] |

[a] Groundwater recharge includes mountain front, intermittent/ephemeral channel seepage, and direct infiltration recharge processes.

[b] To convert ac-ft to m$^3$, multiply by 1,234.

[c] Water use varies by year and is primarily for mining and industrial use (NDWR 2010a,b).

[d] Burbey (1997).

[e] Defined by NDWR.

Source: Rush (1968).

of the estimate of groundwater inputs to the basin (Table 11.3.9.2-2). Increases in groundwater extraction from the basin could impair other users and affect ecological habitats.

Groundwater budgeting allows for quantification of complex groundwater processes at the basin scale, but it ignores the temporal and spatial components of how groundwater withdrawals affect groundwater surface elevations, groundwater flow rates, and connectivity to surface water features such as streams, wetlands, playas, and riparian vegetation. A one-dimensional groundwater modeling analysis was performed to present a simplified depiction of the spatial and temporal effects of groundwater withdrawals by examining groundwater drawdown in a radial direction around the center of the SEZ for the low, medium, and high pumping scenarios. A detailed discussion of the groundwater modeling analysis is presented in Appendix O. It should be noted, however, that the aquifer parameters used for the one dimensional groundwater model (Table 11.3.9.2-3) represent available literature data, and that the model aggregates these value ranges into a simplistic representation of the aquifer.

Currently, the depth to groundwater ranges between 226 and 392 ft (69 and 119 m) in the vicinity of the SEZ (Table 11.3.9.1-7). The modeling results suggest that groundwater

**TABLE 11.3.9.2-3 Aquifer Characteristics and Assumptions Used in the One-Dimensional Groundwater Model for the Proposed Dry Lake SEZ as Revised**

| Parameter | Value |
|---|---|
| Aquifer type/conditions | Basin fill/unconfined |
| Aquifer thickness (ft) | 1,640[b] |
| Hydraulic conductivity (ft/day) | 1[c] |
| Transmissivity ($ft^2$/day) | 1,640 |
| Specific yield | 0.1[c] |
| Analysis period (yr) | 20 |
| High pumping scenario (ac-ft/yr)[a] | 4,586 |
| Medium pumping scenario (ac-ft/yr) | 653 |
| Low pumping scenario (ac-ft/yr) | 26 |

[a] To convert ac-ft to $m^3$, multiply by 1,234.

[b] Source: Freeze and Cherry (1979).

[c] Source: Rush (1968).

withdrawals for solar energy development would result in groundwater drawdown in the vicinity of the SEZ (approximately a 2-mi [3.2-km] radius) that ranges from 17 to more than 75 ft (5.1 to 23 m) for the high pumping scenario, 2.4 to 12 ft (0.7 to 4 m) for the medium pumping scenario, and less than 1 ft (0.3 m) for the low pumping scenario (Figure 11.3.9.2-2). The modeled groundwater drawdown for the high pumping scenario suggests a potential for 10 ft (3 m) of drawdown at a distance of 2 mi (3.2 km) from the center of the SEZ, which could impair groundwater-surface water connectivity via infiltration processes during channel inundation, along with alterations to the wetlands in Dry Lake and the riparian vegetation along the unnamed intermittent/ephemeral streams along the eastern edge of the SEZ that are within the 100-year floodplain.

#### *11.3.9.2.3 Off-Site Impacts: Roads and Transmission Lines*

As stated in the Draft Solar PEIS, impacts associated with the construction of roads and transmission lines primarily deal with water use demands for construction, water quality concerns relating to potential chemical spills, and land disturbance effects on the natural hydrology. Water needed for transmission line construction activities (e.g., for soil compaction, dust suppression, and potable supply for workers) could be trucked to the construction area from an off-site source. If this occurred, water use impacts at the SEZ would be negligible. The Draft Solar PEIS assessment of impacts on water resources from road and transmission line construction remains valid.


**FIGURE 11.3.9.2-2 Estimated One-Dimensional Groundwater Drawdown Resulting from High, Medium, and Low Groundwater Pumping Scenarios over the 20-Year Operational Period at the Proposed Dry Lake SEZ as Revised**

#### *11.3.9.2.4 Summary of Impacts on Water Resources*

The additional information and analyses of water resources presented in this update agree with the information provided in the Draft Solar PEIS, which indicates that the proposed Dry Lake SEZ is located in a desert valley with predominately intermittent/ephemeral surface water features and groundwater in a basin-fill aquifer overlaying a regional-scale carbonate rock aquifer system. Historical groundwater use in the region has led to groundwater declines of approximately 20 ft (6 m) from the 1950s to the 1980s. The NDWR set the perennial yield for the Garnet Valley to 400 ac-ft/yr (490,000 $m^3$/yr), and the basin is currently overappropriated with approximately 3,400 ac-ft/yr (4.2 million $m^3$/yr) committed for beneficial uses. An additional 44,500 ac-ft/yr (55 million $m^3$/yr) of water right applications are held in abeyance, and no new water right applications are being accepted. These baseline conditions suggest that water resources are scarce in the vicinity of the Dry Lake SEZ, and that the primary potential for impacts resulting from solar energy development comes from surface disturbances and groundwater use.

The change in boundaries of the proposed Dry Lake SEZ and the designation of non-development areas within the 100-year floodplain resulted in a decrease in total water demand by approximately 60% for all technologies (Table 11.3.9.2-1). The areas excluded from the SEZ contain the Dry Lake and the associated wetlands adjacent to the northeast corner of the SEZ as revised, and the area of the 100-year floodplain associated with the unnamed washes along the eastern edge of the SEZ. These changes in the SEZ boundaries have reduced potential impacts associated with groundwater withdrawals and surface disturbance on surface water features.

Disturbance to intermittent/ephemeral stream channels within the Dry Lake SEZ could pose an impact on the critical functions of groundwater recharge, sediment transport, flood conveyance, and ecological habitat in the vicinity of the SEZ. The intermittent/ephemeral stream evaluation suggests that several intermittent/ephemeral channels within the SEZ have a moderate sensitivity to disturbance. Surface disturbances within the Dry Lake SEZ could also lead to impacts within upstream and downstream reaches of unnamed intermittent/ephemeral streams that flow through the SEZ. Several programmatic design features described in Section A.2.2 of Appendix A of this Final Solar PEIS describe measures to protect and mitigate for impacts on intermittent/ephemeral water features.

The proposed water use for full-build out scenarios at the Dry Lake SEZ indicate that the low pumping scenario is preferable, given that the medium and high pumping scenarios have the potential to greatly affect both the annual and long-term groundwater budget, and that the high pumping scenario may impair potential groundwater-surface water connectivity in Dry Lake and the unnamed intermittent/ephemeral streams along the eastern edge of the SEZ. The availability of groundwater in the Garnet Valley basin for solar development will largely depend on water rights availability and decisions made by the NDWR.

Predicting impacts associated with groundwater withdrawals in desert regions is often difficult given the heterogeneity of aquifer characteristics, the long time period between the onset of pumping and its effects, and limited data. One of the primary mitigation measures to protect water resources is the implementation of long-term monitoring and adaptive management (see Section A.2.4 of Appendix A). For groundwater, this requires the combination of monitoring and modeling to fully identify the temporal and spatial extent of potential impacts. The BLM is currently working on the development of a more detailed numerical groundwater model for the Dry Lake SEZ, which would more accurately predict potential impacts on surface water features and groundwater drawdown. When the detailed model is completed, it will be made available through the project Web site (http://solareis.anl.gov) for use by applicants, the BLM, and other stakeholders.

#### 11.3.9.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on surface water and groundwater are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some protection of and reduce impacts on water resources.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature has been identified:

- Groundwater analyses suggest that full build-out of dry-cooled and wet-cooled technologies is not feasible; for mixed-technology development scenarios, any proposed dry- or wet-cooled projects should utilize water conservation practices.

The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.3.10 Vegetation

### 11.3.10.1 Affected Environment

Revisions to the boundaries of the proposed Dry Lake SEZ have eliminated a large portion of the wetland mapped by the NWI and playa in the SEZ. In addition, 469 acres (2 km$^2$), consisting of the remaining area of wetland and playa within the SEZ as well as the two predominant washes inflowing from the south, were identified as non-development areas.

As presented in Section 11.3.10.1 of the Draft Solar PEIS, 6 cover types were identified within the area of the proposed Dry Lake SEZ, while 12 cover types were identified in the area of indirect impacts. Sensitive habitats on the SEZ include desert chenopod scrub/mixed salt desertscrub, desert dry washes, dry wash woodland, wetland, and playa. A characteristic species of the Mojave Desert that is present on the SEZ is Mojave yucca (*Yucca schidigera*). Because of the SEZ boundary changes, the North American Warm Desert Playa cover type no longer occurs within the SEZ. Figure 11.3.10.1-1 shows the cover types within the affected area of the Dry Lake SEZ as revised.

### 11.3.10.2 Impacts

As presented in the Draft Solar PEIS, the construction of solar energy facilities within the proposed Dry Lake SEZ would result in direct impacts on plant communities because of the removal of vegetation within the facility footprint during land-clearing and land-grading operations. Approximately 80% of the SEZ would be expected to be cleared with full development of the SEZ. As a result of the changes to the proposed SEZ boundaries, approximately 4,574 acres (19 km$^2$) would be cleared.

Overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the cover type within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of a cover type would be lost; and (3) *large*: >10% of a cover type would be lost.

#### *11.3.10.2.1 Impacts on Native Species*

The analysis presented in the Draft Solar PEIS for the original Dry Lake SEZ boundaries indicated that development would result in a moderate impact on one land cover type and a small impact on all other land cover types occurring within the SEZ (Table 11.3.10.1-1 in the Draft Solar PEIS). Development within the revised Dry Lake SEZ could still directly affect

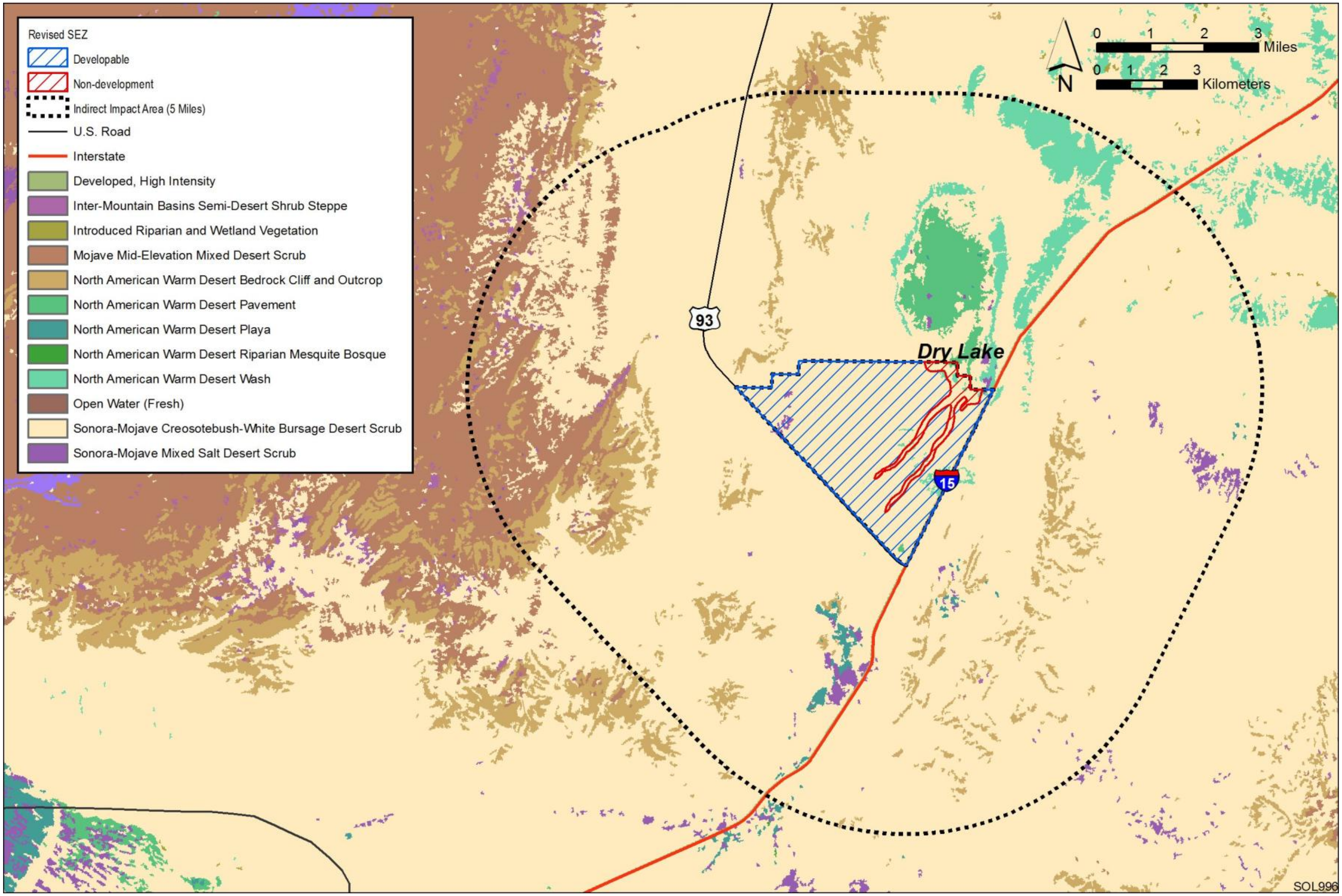


**FIGURE 11.3.10.1-1 Land Cover Types within the Proposed Dry Lake SEZ as Revised**

most of the cover types evaluated in the Draft Solar PEIS, with the exception of North American Warm Desert Playa. The reduction in the developable area would result in reduced impact levels on all cover types in the affected area. The impact magnitude for North American Warm Desert Pavement would change from moderate to small. The impact magnitudes for all other land cover types would remain unchanged compared to original estimates in the Draft Solar PEIS.

Indirect impacts on habitats associated with Dry Lake playa within or near the SEZ, as described in the Draft Solar PEIS, could occur. The indirect impacts from groundwater use, on plant communities in the region that depend on groundwater, could also occur.

##### *11.3.10.2.2 Impacts from Noxious Weeds and Invasive Plant Species*

As presented the Draft Solar PEIS, land disturbance from project activities and indirect effects of construction and operation within the Dry Lake SEZ could potentially result in the establishment or expansion of noxious weeds and invasive species populations, potentially including those species listed in Section 11.3.10.1 of the Draft Solar PEIS. Impacts, such as reduced restoration success and possible widespread habitat degradation, could still occur; however, a small reduction in the potential for such impacts would result from the reduced developable area of the SEZ.

#### 11.3.10.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific species and habitats will determine how programmatic design features are applied, for example:

- All dry wash, dry wash woodland, and chenopod scrub communities within the SEZ shall be avoided to the extent practicable, and any impacts minimized and mitigated in consultation with appropriate agencies. Any yucca, cacti, or succulent plant species that cannot be avoided should be salvaged. A buffer area shall be maintained around dry wash, dry wash woodland, playa, and wetland habitats to reduce the potential for impacts.

- Appropriate engineering controls shall be used to minimize impacts on dry wash, dry wash woodland, wetland, and playa habitats, including downstream occurrences, resulting from surface water runoff, erosion, sedimentation, altered hydrology, accidental spills, or fugitive dust deposition. Appropriate buffers and engineering controls will be determined through agency consultation.

- Groundwater withdrawals shall be limited to reduce the potential for indirect impacts on groundwater-dependent communities, such as mesquite communities. Potential impacts on springs shall be determined through hydrological studies.

It is anticipated that implementation of these programmatic design features will reduce a high potential for impacts from invasive species and impacts on dry wash, dry wash woodland, chenopod scrub, mesquite bosque, riparian, wetland, and playa communities and springs to a minimal potential for impact. Residual impacts on groundwater dependent habitats could result from limiting groundwater withdrawal, and so forth; however, it is anticipated that these impacts would be avoided in the majority of instances.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for vegetation have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.3.11 Wildlife and Aquatic Biota

For the assessment of potential impacts on wildlife and aquatic biota, overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the species' habitat within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of the species' habitat would be lost; and (3) *large*: >10% of the species' habitat would be lost.

### 11.3.11.1 Amphibians and Reptiles

#### *11.3.11.1.1 Affected Environment*

As presented in Section 11.3.11.1 of the Draft Solar PEIS, representative amphibian and reptile species expected to occur within the Dry Lake SEZ include the Great Plains toad (*Bufo cognatus*), red-spotted toad (*Bufo punctatus*), desert horned lizard (*Phrynosoma platyrhinos*), Great Basin collared lizard (*Crotaphytus bicinctores*), long-nosed leopard lizard (*Gambelia wislizenii*), side-blotched lizard (*Uta stansburiana*), western fence lizard (*Sceloporus occidentalis*), western whiptail (*Cnemidophorus tigris*), zebra-tailed lizard (*Callisaurus draconoides*), coachwhip (*Masticophis flagellum*), common kingsnake (*Lampropeltis getula*), glossy snake (*Arizona elegans*), gophersnake (*Pituophis catenifer*), groundsnake (*Sonora semiannulata*), long-nosed snake (*Rhinocheilus lecontei*), nightsnake (*Hypsiglena torquata*), Mojave rattlesnake (*Crotalus scutulatus*), and sidewinder (*Crotalus cerastes*). The reduction in the size of the Dry Lake SEZ does not alter the potential for these species to occur in the affected area.

#### *11.3.11.1.2 Impacts*

As presented in the Draft Solar PEIS, solar energy development within the Dry Lake SEZ could affect potentially suitable habitats for the representative amphibian and reptile species. The analysis presented in the Draft Solar PEIS for the original Dry Lake SEZ boundaries indicated that development would result in a small overall impact on all representative amphibian and reptile species (Table 11.3.11.1-1 in the Draft Solar PEIS). The reduction in the developable area of the Dry Lake SEZ would result in reduced habitat impacts for all representative amphibian and reptile species; the resultant impact levels for all of the representative species would still be small.

#### *11.3.11.1.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features are described in Section A.2.2 of Appendix A of this Final Solar PEIS. With the implementation of required programmatic design features, impacts on amphibian and reptile species are anticipated to be small.

Because of the changes to the SEZ boundaries, the SEZ-specific design feature identified in Section 11.3.11.1.3 of the Draft Solar PEIS (i.e., dry lake and wash habitats should be avoided) is no longer applicable. On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for amphibians and reptiles have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.3.11.2 Birds

#### *11.3.11.2.1 Affected Environment*

As presented in Section 11.3.11.2.1 of the Draft Solar PEIS, a large number of bird species could occur or have potentially suitable habitat within the affected area of the proposed Dry Lake SEZ. Representative bird species identified in the Draft Solar PEIS included (1) shorebirds: killdeer (*Charadrius vociferus*); (2) passerines: ash-throated flycatcher (*Myiarchus cinerascens*), Bewick's wren (*Thryomanes bewickii*), black-tailed gnatcatcher (*Polioptila melanura*), black-throated sparrow (*Amphispiza bilineata*), common poorwill (*Phalaenoptilus nuttallii*), common raven (*Corvus corax*), Costa's hummingbird (*Calypte costae*), crissal thrasher (*Toxostoma crissale*), greater roadrunner (*Geococcyx californianus*), horned lark (*Eremophila alpestris*), ladder-backed woodpecker (*Picoides scalaris*), Le Conte's thrasher (*Toxostoma lecontei*), lesser nighthawk (*Chordeiles acutipennis*), loggerhead shrike (*Lanius ludovicianus*), Lucy's warbler (*Vermivora luciae*), northern mockingbird (*Mimus polyglottos*), rock wren (*Salpinctes obsoletus*), sage sparrow (*Amphispiza belli*), Say's phoebe (*Sayornis saya*), verdin (*Auriparus flaviceps*), and western kingbird (*Tyrannus verticalis*); (3) raptors: American kestrel (*Falco sparverius*), golden eagle (*Aquila chrysaetos*), great horned owl (*Bubo virginianus*), long-eared owl (*Asio otus*), red-tailed hawk (*Buteo jamaicensis*), and turkey vulture (*Cathartes aura*); and (4) upland gamebirds: chukar (*Alectoris chukar*), Gambel's quail (*Callipepla gambelii*), mourning dove (*Zenaida macroura*), and white-winged dove

(*Zenaida asiatica*). The reduction in the size of the Dry Lake SEZ does not alter the potential for these species or other bird species to occur in the affected area.

#### *11.3.11.2.2 Impacts*

As presented in the Draft Solar PEIS, solar energy development within the Dry Lake SEZ could affect potentially suitable bird habitats. The analysis presented in the Draft Solar PES based on the original Dry Lake SEZ boundaries indicated that development would result in a small overall impact on all representative bird species (Table 11.3.11.2-1 in the Draft Solar PEIS). The reduction in the developable area of the Dry Lake SEZ would result in reduced habitat impacts for all representative bird species; however, the resultant impact levels for all of the representative bird species would still be small.

#### *11.3.11.2.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features are described in Section A.2.2 of Appendix A of this Final Solar PEIS. With the implementation of required programmatic design features, impacts on bird species are anticipated to be small.

Because of the change in boundaries of the SEZ, the SEZ-specific design feature identified in Section 11.3.11.2.3 of the Draft Solar PEIS (i.e., dry lake and wash habitats should be avoided) is no longer applicable. On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for birds have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.3.11.3 Mammals

#### *11.3.11.3.1 Affected Environment*

As presented in Section 11.3.11.3.1 of the Draft Solar PEIS, a large number of mammal species were identified that could occur or have potentially suitable habitat within the affected area of the proposed Dry Lake SEZ. Representative mammal species identified in the Draft Solar PEIS included (1) big game species: cougar (*Puma concolor*) and mule deer (*Odocoileus hemionus*); (2) furbearers and small game species: the American badger (*Taxidea taxus*), black-tailed jackrabbit (*Lepus californicus*), bobcat (*Lynx rufus*), coyote (*Canis latrans*, common), desert cottontail (*Sylvilagus audubonii*), gray fox (*Urocyon cinereoargenteus*), kit fox (*Vulpes macrotis*), and red fox (*Vulpes vulpes*); and (3) small nongame species: Botta's pocket gopher (*Thomomys bottae*), cactus mouse (*Peromyscus eremicus*), canyon mouse (*P. crinitis*), deer mouse (*P. maniculatus*), desert kangaroo rat (*Dipodomys deserti*), desert shrew (*Notiosorex crawfordi*), desert woodrat (*Neotoma lepida*), little pocket mouse (*Perognathus longimembris*), long-tailed pocket mouse (*Chaetodipus formosus*), Merriam's pocket mouse (*Dipodomys merriami*), northern grasshopper mouse (*Onychomys leucogaster*), southern grasshopper mouse (*O. torridus*), western harvest mouse (*Reithrodontomys megalotis*), and white-tailed antelope squirrel (*Ammospermophilus leucurus*). Bat species that may occur within the area of the SEZ include the big brown bat (*Eptesicus fuscus*), Brazilian free-tailed bat (*Tadarida brasiliensis*), California myotis (*Myotis californicus*), hoary bat (*Lasiurus cinereus*), long-legged myotis (*M. volans*), silver-haired bat (*Lasionycteris noctivagans*), and western pipistrelle (*Parastrellus hesperus*). The reduction in the size of the Dry Lake SEZ does not alter the potential for these species or any additional mammal species to occur in the affected area.

##### *11.3.11.3.2 Impacts*

As presented in the Draft Solar PEIS, solar energy development within the Dry Lake SEZ could affect potentially suitable habitats of mammal species. The analysis presented in the Draft Solar PEIS based on the original Dry Lake SEZ boundaries indicated that development would result in a small overall impact on all representative mammal species analyzed (Table 11.3.11.3-1 in the Draft Solar PEIS). The reduction in the developable area of the Dry Lake SEZ would result in reduced habitat impacts for all representative mammal species; resultant impact levels for all of the representative mammal species would still be small.

##### *11.3.11.3.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on mammals are described in Section A.2.2 of Appendix A of this Final Solar PEIS. With the implementation of required programmatic design features and the applicable SEZ-specific design features, impacts on mammal species will be reduced.

Because of the change in boundaries of the SEZ, one of the SEZ-specific design features identified in Section 11.3.11.3.3 of the Draft Solar PEIS (i.e., playa and wash habitats should be avoided) is no longer applicable. On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature has been identified:

- To the extent practicable, the fencing around the solar energy development should not block the free movement of mammals, particularly big game species.

If this SEZ-specific design feature is implemented in addition to required programmatic design features, impacts on mammal species are anticipated to be small. The need for additional SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.3.11.4 Aquatic Biota

#### *11.3.11.4.1 Affected Environment*

There are no perennial surface water bodies, wetlands, or streams within the proposed Dry Lake SEZ. The boundaries of the Dry Lake SEZ have been reduced compared to the boundaries given in the Draft Solar PEIS. On the basis of these changes, updates to the Draft Solar PEIS include:

- Approximately 218 acres (1 $km^2$) of Dry Lake are located within the SEZ. However, only 74 acres (<1 $km^2$) are located within a development area.

- There are 3,507 acres (14 $km^2$) of dry lakes present in the area of indirect effects within 5 mi (8 km) of the SEZ, along with associated wetlands. Portions of two intermittent streams (California Wash and Gypsum Wash) totaling 3 mi (5 km) are present within the area of indirect effects (within 5 mi [8 km] of the SEZ).

- Outside of the potential indirect effects area but within 50 mi (80 km) of the SEZ, there are 130,098 acres (526 $km^2$) of permanent lake (Lake Mead), 12,030 acres (49 $km^2$) of the Colorado River, and 44,410 (180 $km^2$) of dry lake. There are also several stream features, including 125 mi (201 km) of perennial streams and 273 mi (439 km) of intermittent streams.

There is no information on aquatic biota in the surface water features in the SEZ. As stated in Appendix C of the Supplement to the Draft Solar PEIS, site surveys can be conducted at the project-specific level to characterize the aquatic biota, if present.

#### *11.3.11.4.2 Impacts*

The types of impacts on aquatic habitats and biota that could occur from development of utility-scale solar energy facilities are discussed in Section 5.10.3 of the Draft and Final Solar PEIS. Aquatic habitats, including wetland areas, present on or near the Dry Lake SEZ could be affected by solar energy development in a number of ways, including (1) direct disturbance, (2) deposition of sediments, (3) changes in water quantity, and (4) degradation of water quality. The impact assessment provided in the Draft Solar PEIS remains valid, with the following updates:

- The amount of surface water features within the SEZ and in the area of indirect effects that could potentially be affected by solar energy development is less because the size of the SEZ has been reduced.

- Most of Dry Lake has been eliminated from the SEZ boundary; therefore, impacts on Dry Lake from construction activities would be less than assumed in the Draft Solar PEIS.

#### *11.3.11.4.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on aquatic species are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific resources and conditions will determine how programmatic design features are applied, for example:

- Appropriate engineering controls shall be implemented to minimize the amount of surface water runoff, contaminants, and fugitive dust reaching Dry Lake, California Wash, and Gypsum Wash.

- Development shall avoid any additional wetlands identified during future site-specific fieldwork.

- The impact of groundwater withdrawals on streams near the SEZ, such as the Muddy River, and on springs, such as those along the north shore of Lake Meade and within the Desert NWR and Moapa NWR, shall be minimized or eliminated.

It is anticipated that implementation of the programmatic design features will reduce impacts on aquatic biota, and if the utilization of water from groundwater or surface water sources is adequately controlled to maintain sufficient water levels in nearby aquatic habitats, the potential impacts on aquatic biota from solar energy development at the Dry Lake SEZ would be small.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for aquatic biota have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.3.12 Special Status Species

### 11.3.12.1 Affected Environment

As presented in Section 11.3.12.1 of the Draft Solar PEIS, 62 special status species were identified that could occur or have potentially suitable habitat within the affected area of the proposed Dry Lake SEZ. The reduction in the size of the Dry Lake SEZ does not alter the potential for these species to occur in the affected area. Figure 11.3.12.1-1 shows the known or potential occurrences of species in the revised affected area of the Dry Lake SEZ that are listed, proposed, or candidates for listing under the ESA. There is no change in the number of groundwater-dependent species that may be affected by solar energy development on the revised SEZ. Impacts on groundwater-dependent species are discussed in the Draft Solar PEIS; updated information regarding impacts on these species is provided in Section 11.3.12.2. Groundwater-dependent species are not further discussed here because the changes to the SEZ boundary are not assumed to alter the impact determination for groundwater-dependent species.

Following the Draft Solar PEIS, additional information provided by the USFWS indicated that the revised Dry Lake SEZ was situated in an area that provides habitat and genetic connectivity between areas with greater habitat suitability, particularly between the Mormon Mesa Critical Habitat Unit west of the SEZ and portions of greater habitat suitability north and east of the SEZ (Figure 11.3.12.1-1). The USFWS identified the entire revised SEZ as priority connectivity habitat for the desert tortoise through a least-cost pathway model (Ashe 2012) based upon the USGS model for desert tortoise predicted suitable habitat (Nussear et al. 2009).

Since publication of the Draft Solar PEIS, 11 additional special status species have been identified that could potentially occur in the affected area, based on county-level occurrences and the presence of potentially suitable habitat. These 11 special status species are all designated sensitive species by the Nevada BLM Office and include (1) plants: sticky ringstem; (2) birds: golden eagle, gray vireo, loggerhead shrike, long-eared owl, and Lucy's warbler, and (3) mammals: big brown bat, California myotis, hoary bat, long-legged myotis, and western pipistrelle. These additional species are discussed in the following paragraphs.

**Sticky Ringstem.** The sticky ringstem is a perennial herb that is designated as a sensitive species by the Nevada BLM. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. It is known from southern Nevada, portions of northern Arizona, New Mexico, Texas, and Mexico. In Nevada, it is primarily known from the Frenchman Mountain area east of Las Vegas and further east to the Muddy Mountains and Gold Butte (VRHCRP 2012). This species occupies soils composed of calcareous shales and clay, loose talus, and gypsum at elevations between 1,700 and 4,000 ft (518 and 1,219 m). It is commonly associated with the Las Vegas bearpoppy. The sticky ringstem is known to occur in Clark County, Nevada, and potentially suitable habitat for this species could occur on the SEZ and portions of the area of indirect effects (Table 11.3.12.1-1).

**Golden Eagle.** The golden eagle is an uncommon to common permanent resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. The species inhabits rolling foothills, mountain areas, and desert shrublands. It nests on cliff faces and in large trees in open areas. Potentially suitable foraging habitat for this species may occur in the revised area of the SEZ and throughout the area of indirect effects (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable nesting habitat (cliffs and rock outcrops) does not occur in the revised area of the SEZ or within the area of indirect effects (Table 11.3.12.1-1).

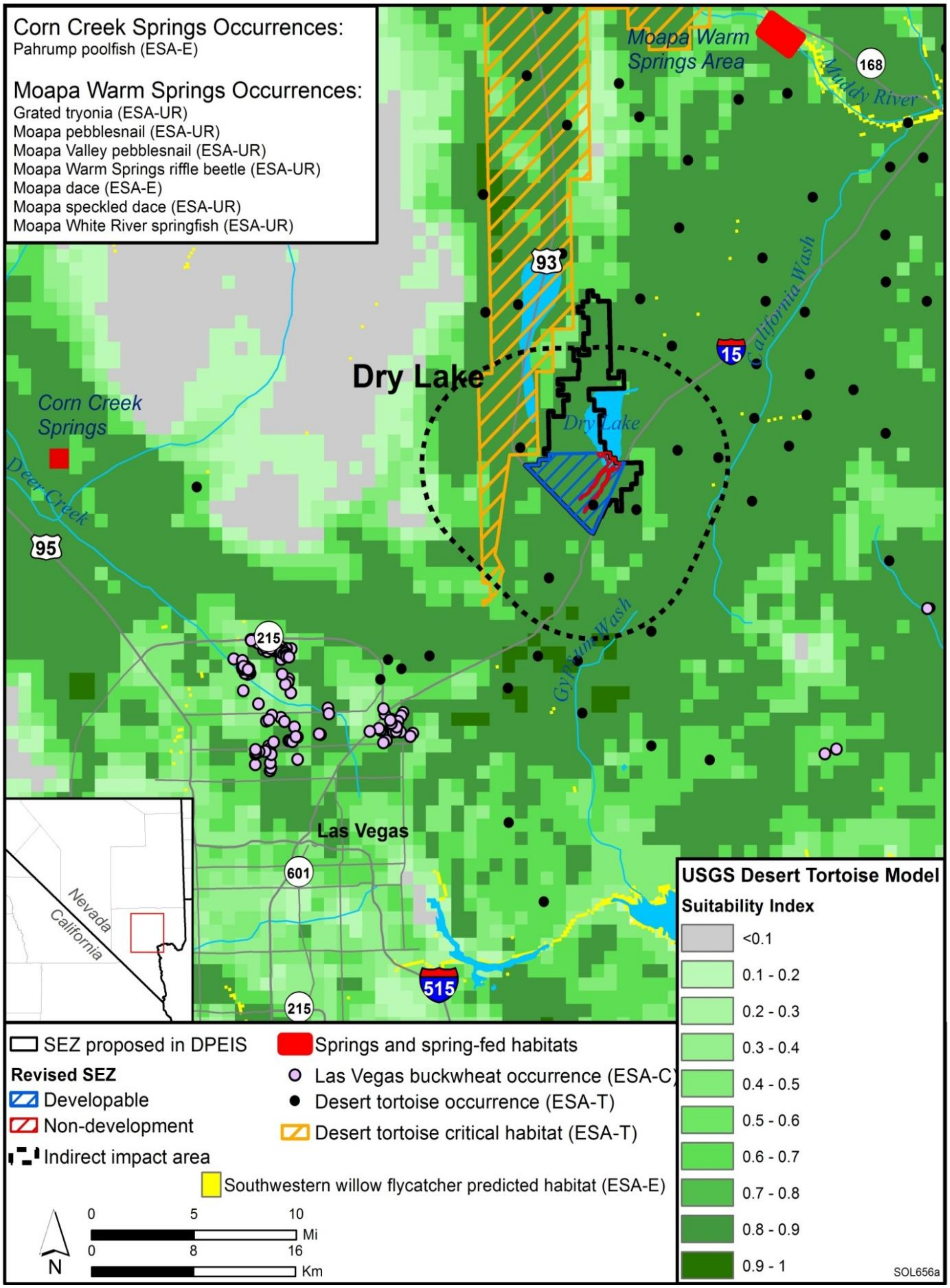


**FIGURE 11.3.12.1-1 Proposed Dry Lake SEZ as Revised and Distribution of Potentially Suitable Habitat for Species Listed under the Endangered Species Act**

**TABLE 11.3.12.1-1 Habitats, Potential Impacts, and Potential Mitigation for Special Status Species That Could Be Affected by Solar Energy Development on the Proposed Dry Lake SEZ as Revised[a]**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Maximum Area of Potential Habitat Affected[d]: Outside SEZ (Indirect Effects)[f] | Overall Impact Magnitude[g] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Plants*** | | | | | | |
| Sticky ringstem | *Anulocaulis leisolenus* | BLM-S; NV-S2 | Known from southern Nevada, northern Arizona, and New Mexico, Texas, and Mexico. Occupies loose soils of calcareous shales and clay, loose talus, and gypsum at elevations between 1,700 and 4,000 ft.[i] About 65,400 acres[j] of potentially suitable habitat occurs in the SEZ region. | 425 acres of potentially suitable habitat lost (0.7% of available potentially suitable habitat) | 1,250 acres of potentially suitable habitat (1.9% of available potentially suitable habitat) | Small overall impact. Avoiding or minimizing disturbance to desert pavement habitat on the SEZ could reduce impacts. In addition, pre-disturbance surveys and avoiding or minimizing disturbance to occupied habitats in the areas of direct effects, translocation of individuals from areas of direct effects, or compensatory mitigation of direct effects on occupied habitats could reduce impacts. |
| ***Birds*** | | | | | | |
| Golden eagle | *Aquila chrysaetos* | BLM-S | An uncommon to common permanent resident and migrant in southern Nevada. Habitat includes rolling foothills, mountain areas, and desert shrublands. Nests on cliff faces and in large trees in open areas. About 4,500,000 acres of potentially suitable habitat occurs within the SEZ region. | 5,665 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) | 92,000 acres of potentially suitable habitat (2.0% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| Gray vireo | *Vireo vicinior* | BLM-S | An uncommon summer resident in arid environments such as pinyon-juniper, chaparral, and desert shrublands. Builds open-cup nests of plant material in forked branches of shrubs or small trees. About 650,000 acres of potentially suitable habitat occurs within the SEZ region. | 0 acres | 8,250 acres of potentially suitable habitat (1.3% of available potentially suitable habitat) | Small overall impact; no direct effects. No species-specific mitigation is warranted. |

**TABLE 11.3.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Maximum Area of Potential Habitat Affected[d]: Outside SEZ (Indirect Effects)[f] | Overall Impact Magnitude[g] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Birds (Cont.)*** | | | | | | |
| Loggerhead shrike | *Lanius ludovicianus* | BLM-S | A common winter resident in lowlands and foothills in southern Nevada. Prefers open habitats with shrubs, trees, utility lines, or other perches. Highest density occurs in open-canopied foothill forests. About 2,000,000 acres of potentially suitable habitat occurs within the SEZ region. | 0 acres | 14,250 acres of potentially suitable habitat (0.7% of available potentially suitable habitat) | Small overall impact; no direct effects. No species-specific mitigation is warranted. |
| Long-eared owl | *Asio otus* | BLM-S | An uncommon year-long resident in southern Nevada. Occurs in desert shrubland environments in proximity to riparian areas such as desert washes. Nests in trees using old nests from other birds or squirrels. About 4,100,000 acres of potentially suitable habitat occurs within the SEZ region. | 5,580 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) | 82,700 acres of potentially suitable habitat (2.0% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |

**TABLE 11.3.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Maximum Area of Potential Habitat Affected[d]: Outside SEZ (Indirect Effects)[f] | Overall Impact Magnitude[g] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Birds (Cont.)*** | | | | | | |
| Lucy's warbler | *Vermivora luciae* | BLM-S | An uncommon summer resident and breeder in desert riparian areas. Occurs in desert wash habitats, especially those dominated by mesquite and saltcedar. Nests in tiny cavities in riparian woodlands. About 81,000 acres of potentially suitable habitat occurs within the SEZ region. | 43 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) | 2,500 acres of potentially suitable habitat (3.1% of available potentially suitable habitat) | Small to large overall impact. Potentially suitable nesting habitat in riparian habitats in the Moapa and Pahranagat Valleys may be affected by groundwater withdrawal. The impact of water withdrawal on the Garnet Valley regional groundwater system that supports aquatic and mesic habitat in the SEZ region would depend on the volume of water withdrawn to support solar energy development on the SEZ. Avoiding or limiting withdrawals from this regional groundwater system could reduce impacts on this species to negligible levels. In addition, pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats (especially nesting habitats) on the SEZ or compensatory mitigation of direct effects on occupied habitats on the SEZ could reduce impacts. The potential for impact and need for mitigation should be determined in coordination with the USFWS and the NDOW. |

**TABLE 11.3.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Maximum Area of Potential Habitat Affected[d]: Outside SEZ (Indirect Effects)[f] | Overall Impact Magnitude[g] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Mammals*** | | | | | | |
| Big brown bat | *Eptesicus fuscus* | BLM-S | Occurs throughout the southwestern United States in various habitat types. Uncommon in hot desert environments, but may occur in areas in close proximity to water sources such as lakes and washes. Roosts in buildings, caves, mines, and trees. About 3,700,000 acres of potentially suitable habitat occurs within the SEZ region. | 5,665 acres of potentially suitable habitat lost (0.2% of available potentially suitable habitat) | 84,700 acres of potentially suitable habitat (2.3% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| California myotis | *Myotis californicus* | BLM-S | A common year-round resident in southern Nevada. Occurs in a variety of habitats, including desert, chaparral, woodlands, and forests. Roosts primarily in crevices but will also use buildings, mines, and hollow trees. About 3,500,000 acres of potentially suitable habitat occurs within the SEZ region. | 5,625 acres of potentially suitable habitat lost (0.2% of available potentially suitable habitat) | 85,700 acres of potentially suitable habitat (2.4% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| Hoary bat | *Lasiurus cinereus* | BLM-S | The most widespread North American bat species, occurs throughout southern Nevada in various habitat types. Occurs in habitats such as woodlands, foothills, desert shrublands, and chaparral. Roosts primarily in trees. About 3,500,000 acres of potentially suitable habitat occurs within the SEZ region. | 5,665 acres of potentially suitable habitat lost (0.2% of available potentially suitable habitat) | 83,700 acres of potentially suitable habitat (2.4% of available suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |

**TABLE 11.3.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Maximum Area of Potential Habitat Affected[d]: Outside SEZ (Indirect Effects)[f] | Overall Impact Magnitude[g] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Mammals (Cont.)*** | | | | | | |
| Long-legged myotis | *Myotis volans* | BLM-S | Common to uncommon year-round resident in southern Nevada. Uncommon in desert and arid grassland environments. Most common in woodlands above 4,000-ft elevation. Forages in chaparral, scrub, woodlands, and desert shrublands. Roosts in trees, caves, and crevices. About 3,700,000 acres of potentially suitable habitat occurs within the SEZ region. | 5,580 acres of potentially suitable habitat lost (0.2% of available potentially suitable habitat) | 83,200 acres of potentially suitable habitat (2.2% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| Western pipistrelle | *Pipistrellus Hesperus* | BLM-S | A common year-round resident of deserts, grasslands, and woodlands in southern Nevada. Occurs in various habitats, including mountain foothill woodlands, desert shrublands, desert washes, and pinyon-juniper woodlands. Roosts primarily in rock crevices; occasionally in mines and caves. About 4,800,000 acres of potentially suitable habitat occurs within the SEZ region. | 5,710 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) | 93,000 acres of potentially suitable habitat (1.9% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |

[a] The species presented in this table represent new species identified following publication of the Draft Solar PEIS or a re-evaluation of those species that were determined to have moderate or large impacts in the Draft Solar PEIS. The other special status species for this SEZ are identified in Table 11.3.12.1-1 of the Draft Solar PEIS.

[b] BLM-S = listed as sensitive by the BLM.

**Footnotes continued on next page.**

**TABLE 11.3.12.1-1 (Cont.)**

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[c] Potentially suitable habitat was determined using SWReGAP habitat suitability models (USGS 2004, 2007). Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[d] Maximum area of potentially suitable habitat that could be affected relative to availability within the SEZ region. Habitat availability for each species within the region was determined by using SWReGAP habitat suitability models (USGS 2004, 2007). This approach probably overestimates the amount of suitable habitat in the project area.

[e] Direct effects within the SEZ consist of the ground-disturbing activities associated with construction and the maintenance of an altered environment associated with operations.

[f] Area of indirect effects was assumed to be the area adjacent to the SEZ within 5 mi (8 km) of the SEZ boundary where ground-disturbing activities would not occur. Indirect effects include effects from surface runoff, dust, noise, lighting, and so on from solar development. The potential degree of indirect effects would decrease with increasing distance away from the SEZ.

[g] Overall impact magnitude categories were based on professional judgment and are as follows: (1) *small*: ≤1% of the population or its habitat would be lost and the activity would not result in a measurable change in carrying capacity or population size in the affected area; (2) *moderate*: >1 but ≤10% of the population or its habitat would be lost and the activity would result in a measurable but moderate (not destabilizing) change in carrying capacity or population size in the affected area; (3) *large*: >10% of a population or its habitat would be lost and the activity would result in a large, measurable, and destabilizing change in carrying capacity or population size in the affected area. Note that much greater weight was given to the magnitude of direct effects because those effects would be difficult to mitigate. Design features would reduce most indirect effects to negligible levels.

[h] Species-specific mitigations are suggested here, but final mitigations should be developed in consultation with state and federal agencies and should be based on pre-disturbance surveys.

[i] To convert ft to m, multiply by 0.3048.

[j] To convert acres to km$^2$, multiply by 0.004047.

**Gray Vireo.** The gray vireo is an uncommon summer resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. The species occurs in arid environments such as pinyon-juniper, chaparral, and desert shrublands. It builds open-cup nests of plant material in forked branches of shrubs or small trees. On the basis of an evaluation of the SWReGAP habitat suitability model for this species, potentially suitable habitat does not occur in the revised area of the SEZ; however, potentially suitable breeding and nonbreeding habitat may occur outside the SEZ in the area of indirect effects (Table 11.3.12.1-1).

**Loggerhead Shrike.** The loggerhead shrike is a common winter resident in lowlands and foothills of southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. The species occurs in open habitats with shrubs, trees, utility lines, or other perches. The highest densities of this species occur in open-canopied foothill forests. On the basis of an evaluation of the SWReGAP habitat suitability model for this species, potentially suitable habitat does not occur in the revised area of the SEZ; however, potentially suitable foraging habitat may occur outside the SEZ in the area of indirect effects (Table 11.3.12.1-1).

**Long-Eared Owl.** The long-eared owl is an uncommon year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. The species inhabits desert shrubland environments in proximity to riparian areas such as desert washes. It nests in trees using old nests from other birds or squirrels. Potentially suitable foraging habitat for this species may occur in the revised area of the SEZ and throughout the area of indirect effects (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable nesting habitat (forests) does not occur in the SEZ or within the area of indirect effects (Table 11.3.12.1-1).

**Lucy's Warbler.** The Lucy's warbler is an uncommon summer resident and breeder in desert riparian areas of southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. The species inhabits desert wash habitats, especially those dominated by mesquite and saltcedar. It nests in tiny cavities in riparian woodlands. On the basis of an evaluation of the SWReGAP habitat suitability model for this species, potentially suitable habitat does not occur in the revised area of the SEZ; however, potentially suitable breeding and nonbreeding habitat may occur outside the SEZ in the area of indirect effects (Table 11.3.12.1-1).

**Big Brown Bat.** The big brown bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. The big brown bat is uncommon in desert habitats but may occur in desert shrublands that are in close proximity to water sources. The species inhabits desert shrubland environments in proximity to riparian areas such as desert washes. It roosts in buildings, caves, mines, and trees. Potentially suitable foraging habitat for this species may occur in the revised area of the SEZ and throughout the area of indirect effects (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur in the revised area of the SEZ or within the area of indirect effects (Table 11.3.12.1-1).

**California Myotis.** The California myotis is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. The species inhabits desert, chaparral, woodlands, and forests. It roosts primarily in crevices but will also use buildings, mines, and hollow trees. Potentially suitable foraging habitat for this species may occur in the revised area of the SEZ and throughout the area of indirect effects (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur in the revised area of the SEZ or within the area of indirect effects (Table 11.3.12.1-1).

**Hoary Bat.** The hoary bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. The species inhabits woodlands, foothills, desert shrublands, and chaparral. It roosts primarily in trees. Potentially suitable foraging habitat for this species may occur in the revised area of the SEZ and throughout the area of indirect effects (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests) does not occur in the revised area of the SEZ or within the area of indirect effects (Table 11.3.12.1-1).

**Long-Legged Myotis.** The long-legged myotis is a common to uncommon year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. This species is uncommon in desert and arid grassland environments and most common in woodlands above 4,000-ft elevation. It forages in chaparral, scrub, woodlands, and desert shrublands and roosts in trees, caves, and crevices. Potentially suitable foraging habitat for this species may occur in the revised area of the SEZ and throughout the area of indirect effects (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur in the revised area of the SEZ or within the area of indirect effects (Table 11.3.12.1-1).

**Western Pipistrelle.** The western pipistrelle is a common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. The species inhabits mountain foothill woodlands, desert shrublands, desert washes, and pinyon-juniper woodlands. It roosts primarily in rock crevices and occasionally in mines and caves. Potentially suitable foraging habitat for this species may occur in the revised area of the SEZ and throughout the area of indirect effects (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (rock outcrops) does not occur in the revised area of the SEZ or within the area of indirect effects (Table 11.3.12.1-1).

### 11.3.12.2 Impacts

Overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the special status species' habitat within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of the special status species' habitat would be lost; and (3) *large*: >10% of the special status species' habitat would be lost.

As presented in the Draft Solar PEIS, solar energy development within the Dry Lake SEZ could affect potentially suitable habitats of special status species. The analysis presented in the Draft Solar PEIS for the original Dry Lake SEZ boundaries indicated that development would result in no impact or a small overall impact on all special status species, except those that are groundwater-dependent (Table 11.3.12.1-1 in the Draft Solar PEIS). In the Draft Solar PEIS, those special status species that could be affected by groundwater withdrawals on the SEZ were determined to have impacts that ranged from small to large depending upon the scale of development and water needs to serve development on the SEZ. Development within the revised area of the Dry Lake SEZ could still affect the same 62 species evaluated in the Draft Solar PEIS; however, the reduction in the developable area would result in reduced (and still small) impact levels compared to original estimates in the Draft Solar PEIS. Pre-disturbance consultation with the BLM and the necessary state and federal agencies should be conducted to determine the project-specific water needs and the potential for impact on these species (these groundwater-dependent species are listed in Table 11.3.12.1-1 of the Draft Solar PEIS and are listed in Section 11.3.12.3).

In the Draft Solar PEIS, it was determined that solar energy development within the Dry Lake SEZ would have a small overall effect on the desert tortoise. Impacts on this species are not requantified in this update for the Final Solar PEIS because it is expected that the overall impact will remain small. Following publication of the Draft Solar PEIS, the USFWS has identified the revised SEZ as being situated in an area that provides habitat and genetic connectivity between areas with greater habitat suitability (Ashe 2012). The USFWS has also determined that the revised SEZ is within high-priority connectivity areas, which are necessary to facilitate natural processes of gene exchange between populations in order to maintain population viability. Solar energy development on the Dry Lake SEZ, therefore, may isolate and fragment these tortoise populations by creating impediments to natural migration patterns.

Development of actions to reduce impacts (e.g., reasonable and prudent alternatives, reasonable and prudent measures, and terms and conditions) on the desert tortoise would require formal consultation with the USFWS under Section 7 of the ESA. This project-level consultation will tier from the programmatic ESA Section 7 consultation that will be completed with the PEIS ROD. Priority should be given to the development of a thorough survey protocol and measures to avoid impacts on known tortoise populations. If necessary, minimization measures and mitigation measures, which could potentially include translocation actions and compensatory mitigation, may be required. These consultations may be used to authorize incidental take statements per Section 10 of the ESA (if necessary). Consultation with the NDOW should also occur to determine any state mitigation requirements.

Inherent dangers to tortoises are associated with their capture, handling, and translocation from the SEZ. These actions, if conducted improperly, can result in injury or death. To minimize these risks and as stated above, the desert tortoise translocation plan should be developed in consultation with the USFWS and should follow the *Guidelines for Handling Desert Tortoises during Construction Projects* (Desert Tortoise Council 1994) and other current translocation guidance provided by the USFWS. Consultation will identify potentially suitable recipient locations, density thresholds for tortoise populations in recipient locations, and procedures for pre-disturbance clearance surveys and tortoise handling, as well as disease-testing and post-translocation monitoring and reporting requirements. Despite some risk of mortality or decreased fitness, translocation is widely accepted as a useful strategy for the conservation of the desert tortoise (Field et al. 2007).

To offset impacts of solar development on the SEZ, compensatory mitigation may be needed to balance the acreage of habitat lost with acquisition of lands that would be improved and protected for desert tortoise populations (USFWS 1994). Compensation can be accomplished by improving the carrying capacity for the desert tortoise on the acquired lands. Other mitigation actions may include funding for the habitat enhancement of the desert tortoise on existing federal lands. Consultation with the USFWS and NDOW would be necessary to determine the appropriate mitigation ratio to acquire, enhance, and preserve desert tortoise compensation lands.

In addition, impacts on the 11 BLM-designated sensitive species that were not evaluated for the Dry Lake SEZ in the Draft Solar PEIS are discussed below and in Table 11.3.12.1-1. The impact assessment for these additional species was carried out in the same way as the impact assessment for those species analyzed in the Draft Solar PEIS (Section 11.3.12.2).

**Sticky Ringstem.** The sticky ringstem was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. According to the SWReGAP land cover model, approximately 425 acres (2 km$^2$) of potentially suitable desert pavement habitat on the revised SEZ may be directly affected by construction and operations of solar energy development (Table 11.3.12.1-1). This direct effects area represents about 0.7% of available suitable habitat in the SEZ region. About 1,250 acres (5 km$^2$) of potentially suitable habitat occurs in the area of potential indirect effects; this area represents about 1.9% of the available potentially suitable habitat in the SEZ region (Table 11.3.12.1-1).

The overall impact on the sticky ringstem from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake SEZ is considered small, because less than 1% of potentially suitable habitat for this species occurs in the area of direct effects. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts to negligible levels.

Avoiding or minimizing disturbance to desert pavement habitat on the SEZ could reduce direct impacts on this species to negligible levels. Impacts may also be reduced by conducting pre-disturbance surveys and avoiding or minimizing disturbance to occupied habitats in the area of direct effects. If avoidance or minimization is not feasible, plants could be translocated from the area of direct effects to protected areas that would not be affected directly or indirectly by future development. Alternatively, or in combination with translocation, a compensatory mitigation plan could be developed and implemented to mitigate direct effects on occupied habitats. Compensation could involve the protection and enhancement of existing occupied or suitable habitats to compensate for habitats lost to development. A comprehensive mitigation strategy that uses one or more of these options could be designed to completely offset the impacts of development.

**Golden Eagle.** The golden eagle was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. This species is an uncommon to common permanent resident in southern Nevada, and potentially suitable foraging habitat is expected to occur in the revised affected area of the Dry Lake SEZ. Approximately 5,665 acres (23 $km^2$) of potentially suitable foraging habitat in the revised area of the SEZ could be directly affected by construction and operations (Table 11.3.12.1-1). This direct impact area represents 0.1% of potentially suitable habitat for the golden eagle in the SEZ region. About 92,000 acres (372 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.0% of the available suitable foraging habitat in the SEZ region (Table 11.3.12.1-1). Most of this area could serve as foraging habitat (open shrublands). On the basis of an evaluation of SWReGAP land cover types, potentially suitable nesting habitat (cliffs and rock outcrops) does not occur in the SEZ or within the area of indirect effects.

The overall impact on the golden eagle from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake SEZ is considered small because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents less than 1% of potentially suitable foraging habitat in the SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of direct impacts on all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the golden eagle because potentially suitable shrubland is widespread throughout the area of direct effects and readily available in other portions of the affected area.

**Gray Vireo.** The gray vireo was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. This species is an uncommon summer resident in southern Nevada. The gray vireo is not known to occur on the revised area of the Dry Lake SEZ, and suitable habitat is not expected to occur on the SEZ. However, on the basis of an evaluation of the SWReGAP habitat suitability model for this species, approximately 8,250 acres (33 $km^2$) of potentially suitable breeding and nonbreeding habitat may occur outside the SEZ in the area of indirect effects. This area represents about 1.3% of the potentially suitable foraging habitat in the SEZ region (Table 11.3.12.1-1).

The overall impact on the gray vireo from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Dry Lake SEZ is considered small because no potentially suitable habitat for this species occurs in the area of direct effects, and only indirect effects are possible. The implementation of programmatic design features may be sufficient to reduce indirect impacts on this species to negligible levels.

**Loggerhead Shrike.** The loggerhead shrike was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. This species is a common winter resident in lowlands and foothills of southern Nevada. The loggerhead shrike is not known to occur in the revised area of the Dry Lake SEZ, and suitable habitat is not expected to occur on the SEZ. However, on the basis of an evaluation of the SWReGAP habitat suitability model for this species, approximately 14,250 acres (58 km$^2$) of potentially suitable foraging habitat may occur outside the SEZ in the area of indirect effects. This area represents about 0.7% of the potentially suitable foraging habitat in the SEZ region (Table 11.3.12.1-1).

The overall impact on the loggerhead shrike from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake SEZ is considered small because no potentially suitable habitat for this species occurs in the area of direct effects, and only indirect effects are possible. The implementation of programmatic design features may be sufficient to reduce indirect impacts on this species to negligible levels.

**Long-Eared Owl.** The long-eared owl was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. This species is an uncommon to common permanent resident in southern Nevada, and potentially suitable foraging habitat is expected to occur in the revised affected area of the Dry Lake SEZ. Approximately 5,580 acres (23 km$^2$) of potentially suitable foraging habitat on the revised area of the SEZ could be directly affected by construction and operations (Table 11.3.12.1-1). This direct impact area represents 0.1% of potentially suitable habitat in the SEZ region. About 82,700 acres (335 km$^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.0% of the available suitable foraging habitat in the SEZ region (Table 11.3.12.1-1).

The overall impact on the long-eared owl from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake SEZ is considered small because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents less than 1% of potentially suitable foraging habitat in the SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of direct impacts on all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the long-eared owl because potentially suitable shrubland is widespread throughout the area of direct effects and readily available in other portions of the affected area.

**Lucy's Warbler.** The Lucy's warbler was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. This species is an uncommon summer resident and breeder in desert riparian areas of southern Nevada. The Lucy's warbler is not known to occur in the revised area of the Dry Lake SEZ. However, approximately 43 acres (0.2 km$^2$) of potentially suitable foraging or nesting habitat in the revised area of the SEZ could be directly affected by construction and operations (Table 11.3.12.1-1). This direct impact area represents 0.1% of potentially suitable habitat in the SEZ region. About 2,500 acres (10 km$^2$) of potentially suitable foraging or nesting habitat occurs in the area of indirect effects; this area represents about 3.1% of the available suitable habitat in the SEZ region (Table 11.3.12.1-1).

Riparian habitats in the Moapa Valley that may provide suitable nesting and foraging habitat for the Lucy's warbler may be affected by spring discharges associated with the Garnet Valley regional groundwater basin. Solar energy development in the revised area of the Dry Lake SEZ may require water from the same regional groundwater basin that supports these riparian habitats. As discussed for groundwater-dependent species in the Draft Solar PEIS (Section 11.3.12.2.1), impacts on this species could range from small to large depending upon the solar energy technology deployed, the scale of development within the SEZ, and the cumulative rate of groundwater withdrawals (Table 11.3.12.1-1).

The implementation of programmatic design features and complete avoidance or limitation of groundwater withdrawals from the regional groundwater system would reduce impacts on the Lucy's warbler to small or negligible levels. Impacts can be better quantified for specific projects once water needs are identified. In addition, avoiding or minimizing disturbance to riparian areas on the SEZ would reduce direct impacts on this species. Impacts also could be reduced by conducting pre-disturbance surveys and avoiding or minimizing disturbance to occupied habitats (especially nests) in the area of direct effects. If avoidance or minimization is not feasible, a compensatory mitigation plan could be developed and implemented to mitigate direct effects on occupied habitats. Compensation could involve the protection and enhancement of existing occupied or suitable habitats to compensate for habitats lost to development. A comprehensive mitigation strategy that uses one or both of these options could be designed to completely offset the impacts of development.

**Big Brown Bat.** The big brown bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. Suitable roosting habitats (caves, forests, and buildings) are not expected to occur in the revised area of the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 5,665 acres (25 $km^2$) of potentially suitable foraging habitat in the revised area of the SEZ could be directly affected by construction and operations (Table 11.3.12.1-1). This direct impact area represents about 0.2% of potentially suitable foraging habitat in the region. About 84,700 acres (343 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.3% of the available suitable foraging habitat in the region (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable roosting habitat (forests and rock outcrops) exists within the SEZ or within the area of indirect effects.

The overall impact on the big brown bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

**California Myotis.** The California myotis is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests and rock outcrops) are not expected to occur in the revised area of the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 5,625 acres (23 $km^2$) of potentially suitable foraging habitat in the revised area of the SEZ could be directly affected by construction and operations (Table 11.3.12.1-1). This direct impact area represents about 0.2% of potentially suitable foraging habitat in the region. About 85,700 acres (347 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.4% of the available suitable foraging habitat in the region (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable roosting habitat (forests and rock outcrops) exists within the SEZ or within the area of indirect effects.

The overall impact on the California myotis from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

**Hoary Bat.** The hoary bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests) are not expected to occur in the revised area of the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 5,665 acres (23 $km^2$) of potentially suitable foraging habitat in the revised area of the SEZ could be directly affected by construction and operations (Table 11.3.12.1-1). This direct impact area represents about 0.2% of potentially suitable foraging habitat in the region. About 83,700 acres (339 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.4% of the available suitable foraging habitat in the region (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable roosting habitat (forests) exists within the revised area of the SEZ or within the area of indirect effects.

The overall impact on the hoary bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

**Long-Legged Myotis.** The long-legged myotis is a common to uncommon year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests and rock outcrops) are not expected to occur in the revised area of the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 5,580 acres (23 $km^2$) of potentially suitable foraging habitat in the revised area of the SEZ could be directly affected by construction and operations (Table 11.3.12.1-1). This direct impact area represents about 0.2% of potentially suitable foraging habitat in the region. About 83,200 acres (337 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.2% of the available suitable foraging habitat in the region (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable roosting habitat (forests and rock outcrops) exists within the SEZ or within the area of indirect effects.

The overall impact on the long-legged myotis from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

**Western Pipistrelle.** The western pipistrelle is a common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests and rock outcrops) are not expected to occur in the revised area of the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 5,710 acres (23 $km^2$) of potentially suitable foraging habitat in the revised area of the SEZ could be directly affected by construction and operations (Table 11.3.12.1-1). This direct impact area represents about 0.1% of potentially suitable foraging habitat in the region. About 93,000 acres (376 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 1.9% of the available suitable foraging habitat in the region (Table 11.3.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable roosting habitat (forests and rock outcrops) exists within the SEZ or within the area of indirect effects.

The overall impact on the western pipistrelle from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

#### 11.3.12.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on special status and rare species are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific resources and conditions will determine how programmatic design features are applied, for example:

- Pre-disturbance surveys should be conducted within the SEZ to determine the presence and abundance of special status species, including those identified in Table 11.3.12.1-1 of the Draft Solar PEIS, as well as those additional species presented in Table 11.3.12.1-1 of this update for the Final Solar PEIS. Disturbance to occupied habitats for these species shall be avoided or minimized to the extent practicable. If avoiding or minimizing impacts on occupied habitats is not possible, translocation of individuals from areas of direct effects, or compensatory mitigation of direct effects on occupied habitats may reduce impacts. A comprehensive mitigation strategy for special status species that uses one or more of these options to offset the impacts of development shall be developed in coordination with the appropriate federal and state agencies.

- Consultation with the USFWS and the NDOW shall be conducted to address the potential for impacts on the following four species currently listed as threatened or endangered under the ESA: Moapa dace, Pahrump poolfish, desert tortoise, and southwestern willow flycatcher. Consultation will identify an appropriate survey protocol, avoidance and minimization measures, and, if appropriate, reasonable and prudent alternatives, reasonable and prudent measures, and terms and conditions for incidental take statements.

- Coordination with the USFWS and NDOW shall be conducted for the following seven species that are candidates or under review for listing under the ESA that may be affected by solar energy development on the SEZ: Las Vegas buckwheat, grated tryonia, Moapa pebblesnail, Moapa Valley pebblesnail, Moapa Warm Spring riffle beetle, Moapa speckled dace, and Moapa White River springfish. Coordination would identify an appropriate survey protocol and mitigation requirements, which may include avoidance, minimization, translocation, or compensation.

- Avoiding or minimizing disturbance to desert wash habitat on the SEZ may reduce or eliminate impacts on the following 12 special status species: beaver dam breadroot, dune sunflower, halfring milkvetch, Las Vegas buckwheat, Littlefield milkvetch, Parish's phacelia, rosy two-tone beardtongue, sticky buckwheat, threecorner milkvetch, yellow two-tone beardtongue, Lucy's warbler, and phainopepla.

- Avoiding or minimizing disturbance to desert pavement habitat on the SEZ may reduce or eliminate impacts on the following six special status species:

dune sunflower, Las Vegas bearpoppy, mottled milkvetch, silverleaf sunray, sticky ringstem, threecorner milkvetch, and red-tail blazing star bee.

- Avoiding or minimizing disturbance to playa habitat on the SEZ to reduce or eliminate impacts on the following two special status species: Littlefield milkvetch and Parish's phacelia.

- Avoidance or minimization of groundwater withdrawals from the Garnet Valley basin may reduce or eliminate impacts on the following 14 groundwater-dependent special status species: grated tryonia, Moapa pebblesnail, Moapa Valley pebblesnail, Moapa Warm Springs riffle beetle, Spring Mountains springsnail, Warm Springs naucorid, Moapa dace, Moapa speckled dace, Moapa White River springfish, Pahrump poolfish, southwestern toad, Lucy's warbler, phainopepla, and southwestern willow flycatcher.

It is anticipated that implementation of these programmatic design features will reduce the majority of impacts on the special status species from habitat disturbance and groundwater use.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for special status species have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis. Projects will comply with terms and conditions set forth by the USFWS Biological Opinion resulting from the programmatic consultation and any necessary project-specific ESA Section 7 consultations.

## 11.3.13 Air Quality and Climate

### 11.3.13.1 Affected Environment

Except as noted below, the information for air quality and climate presented in the affected environment of the Draft Solar PEIS remains valid.

#### *11.3.13.1.1 Existing Air Emissions*

The Draft Solar PEIS presented Clark County emissions data for 2002. More recent data for 2008 (EPA 2011a) were reviewed. The two emissions inventories used different sources and assumptions; for example, the 2008 data did not include biogenic VOC emissions, and the Mohave coal-fired power plant, which was the dirtiest in the western United States, closed in 2005. In the more recent data, emissions of $SO_2$, $NO_x$, CO, and VOC were lower, while emissions of $PM_{10}$ and $PM_{2.5}$ were higher. These changes would not affect modeled air quality impacts presented in this update.

#### *11.3.13.1.2 Air Quality*

The calendar quarterly average NAAQS of 1.5 μg/$m^3$ for lead (Pb) presented in Table 11.3.13.1-2 of the Draft Solar PEIS has been replaced by the rolling 3-month standard (0.15 μg/$m^3$). The federal 24-hour and annual $SO_2$, 1-hour $O_3$, and annual $PM_{10}$ standards have been revoked as well (EPA 2011b). These changes will not affect the modeled air quality impacts presented in this update. Nevada SAAQS have not been changed.

On September 27, 2010, Clark County was redesignated from a nonattainment to a maintenance area for CO. As noted in the Draft Solar PEIS, the proposed Dry Lake SEZ lies outside this area, and the conclusion in the Draft Solar PEIS that the proposed Dry Lake SEZ is in attainment for all criteria pollutants except 8-hour ozone remains valid.

The size of the proposed Dry Lake SEZ was reduced from 15,649 acres (63 $km^2$) to 5,717 acres (23 $km^2$). On the basis of this reduction, the distances to the nearest Class I areas are somewhat larger than was presented in the Draft Solar PEIS. However, only one Class I area (Grand Canyon NP) lies closer than the 62-mi (100-km) distance within which the EPA recommends that the permitting authorities notify the Federal Land Managers. Thus, the conclusion in the Draft Solar PEIS remains valid.

### 11.3.13.2 Impacts

#### *11.3.13.2.1 Construction*

**Methods and Assumptions**

Except for the area disturbed at any one time during construction, the methods and modeling assumptions have not changed substantially from those presented in the Draft Solar PEIS. On the basis of the reduced size of the SEZ, air quality impacts for this Final Solar PEIS were modeled by assuming that a maximum of 3,000 acres (12.14 $km^2$) would be disturbed for one project at any one time in the SEZ; the Draft Solar PEIS assumed disturbance of a maximum of 6,000 acres (24.28 $km^2$) at any one time.

**Results**

Potential particulate air impacts from construction were remodeled based on the updated boundaries of the proposed Dry Lake SEZ.[1] Changes in magnitude to predicted impacts at the boundary would be expected to be larger than changes at greater distances from the SEZ. Table 11.3.13.2-1 presents the updated maximum modeled concentrations from construction fugitive dust.

The updated maxima are lower than those in the Draft Solar PEIS, as would be expected given the reduction in the area assumed to be disturbed. Reductions were larger for the annual maximum increment (by about 42%) than for the 24-hour maximum increment (by about 5 to 12%). Totals, except for annual $PM_{2.5}$, could still exceed the NAAQS/SAAQS levels. These updated predictions are still consistent with the conclusion in the Draft Solar PEIS that maximum particulate levels in the vicinity of the SEZ could exceed the standard levels used for comparison. These high $PM_{10}$ concentrations would be limited to the immediate areas surrounding the SEZ boundary and would decrease quickly with distance.

Other locations modeled in the Draft Solar PEIS include Moapa, Moapa Valley, Overton, and the nearest residences near North Las Vegas. The updated analysis conducted for this Final Solar PEIS predicted concentrations at all modeled locations lower than those presented in the Draft Solar PEIS. The conclusions presented in the Draft Solar PEIS remain valid with concentrations exceeding NAAQS/SAAQS values only at or near the SEZ boundary.

Updated 24-hour and annual $PM_{10}$ concentration increments at the surrogate receptors[2] for the nearest Class I Area—Grand Canyon NP in Arizona—are lower than those presented in the Draft Solar PEIS; the updated 24-hour $PM_{10}$ increment is reduced from a value exceeding the 24-hour Class I PSD increment in the Draft Solar PEIS to a value of about 89% of the increment. These surrogate receptors are more than 23 mi (37 km) from the Grand Canyon NP and the concentrations would be even lower in the Grand Canyon. The conclusion in the Draft Solar PEIS that the 24-hour $PM_{10}$ Class I PSD increment could be somewhat exceeded in the Grand Canyon NP is updated for this Final Solar PEIS to conclude that all Class I PSD increments for PM would be met at the nearest Class I area.

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[1] At this programmatic level, detailed information on construction activities, such as facility size, type of solar technology, heavy equipment fleet, activity level, work schedule, and so forth, is not known; thus air quality modeling cannot be conducted. Therefore, it has been assumed that an area of 3,000 acres (12.14 $km^2$) would be disturbed continuously, and the modeling results and discussion here should be interpreted in that context. During the site-specific project phase, more detailed information would be available and more realistic air quality modeling analysis could be conducted. It is likely that predicted impacts on ambient air quality for specific projects would be much lower than those presented in this Final Solar PEIS.

[2] Because the nearest Class I area is more than 31 mi (50 km) from the SEZ (which exceeds the maximum modeling distance), several regularly spaced receptors in the direction of the nearest Class I area were selected as surrogates for the PSD analysis.

**TABLE 11.3.13.2-1 Maximum Air Quality Impacts from Emissions Associated with Construction Activities for the Proposed Dry Lake SEZ as Revised**

| | | | Concentration (µg/m³) | | | | Percentage of NAAQS/SAAQS | |
|---|---|---|---|---|---|---|---|---|
| Pollutant[a] | Averaging Time | Rank[b] | Maximum Increment[b] | Background[c] | Total | NAAQS/ SAAQS | Increment | Total |
| $PM_{10}$ | 24 hours | H6H | 552 | 97.0 | 649 | 150 | 368 | 433 |
| | Annual | –[d] | 50.9 | 22.0 | 72.9 | 50 | 102 | 146 |
| $PM_{2.5}$ | 24 hours | H8H | 33.6 | 10.2 | 43.8 | 35 | 96 | 125 |
| | Annual | – | 5.1 | 4.1 | 9.1 | 15 | 34 | 61 |

[a] $PM_{2.5}$ = particulate matter with a diameter of ≤2.5 µm; $PM_{10}$ = particulate matter with a diameter of ≤10 µm.

[b] Concentrations for attainment demonstration are presented: H6H = highest of the sixth-highest concentrations at each receptor over the 5-year period; H8H = highest of the multiyear average of the eighth-highest concentrations at each receptor over the 5-year period. For the annual average, multiyear averages of annual means over the 5-year period are presented. Maximum concentrations are predicted to occur at the site boundaries.

[c] See Table 11.3.13.1-2 of the Draft Solar PEIS.

[d] A dash indicates not applicable.

Except for the Class I PSD increments, the conclusions presented in the Draft Solar PEIS remain valid. Predicted 24-hour and annual $PM_{10}$ and 24-hour $PM_{2.5}$ concentration levels could exceed the standard levels at the SEZ boundaries and in the immediate surrounding areas during the construction of solar facilities. To reduce potential impacts on ambient air quality and in compliance with programmatic design features, aggressive dust control measures would be used. Potential air quality impacts on nearby communities would be much lower. The annual $PM_{2.5}$ concentration level is predicted to be lower than its standard level. Modeling conducted for this Final Solar PEIS indicates that emissions from construction activities are not anticipated to cause particulate levels to exceed the Class I PSD increments at the nearest federal Class I area (Grand Canyon NP). Accordingly, it is anticipated that impacts of construction activities on ambient air quality would be moderate and temporary, as concluded in the Draft Solar PEIS.

With the reduced size of the SEZ, emissions from construction equipment and vehicles would be less than those estimated in the Draft Solar PEIS. Any potential impacts on AQRVs at nearby federal Class I areas would be less. Thus, as concluded in the Draft Solar PEIS, emissions from construction-related equipment and vehicles would be temporary and could cause some unavoidable but short-term impacts.

#### *11.3.13.2.2 Operations*

The reduction in the developable area of the proposed Dry Lake SEZ by about 63% decreases the generating capacity and annual power generation by a similar percentage and thus decreases the potentially avoided emissions presented in the Draft Solar PEIS. Total revised power generation capacity ranging from 508 to 915 MW is estimated for the Dry Lake SEZ for various solar technologies (see Section 11.3.1). As explained in the Draft Solar PEIS, the estimated amount of emissions avoided for the solar technologies evaluated depends only on the megawatts of conventional fossil fuel–generated power avoided.

Table 11.3.13.2-2 in the Draft Solar PEIS provided estimates for emissions potentially avoided by a solar facility. These estimates were updated by reducing emissions by about 63%, as shown in the revised Table 11.3.13.2.-2. For example, for the technologies estimated to require 9 acres/MW (power tower, dish engine, and PV), up to 1,077 tons of $NO_X$ emissions per year (36.53% × the low-end value of 2,949 tons/year tabulated in the Draft Solar PEIS) could be avoided by full solar development of the revised area of the proposed Dry Lake SEZ. Although the total emissions avoided by full solar development of the proposed SEZ are considerably reduced from those presented in the Draft Solar PEIS, the conclusions of the Draft Solar PEIS remain valid; that is, if the proposed Dry Lake SEZ were fully developed, the emissions avoided could be substantial. Power generation from fossil fuel–fired power plants accounts for about 93% of the total electric power generated in Nevada, of which the contributions from natural gas and coal combustion are comparable. Thus, solar facilities built in the Dry Lake SEZ could avoid relatively more fossil fuel emissions than those built in other states that rely less on fossil fuel–generated power.

#### *11.3.13.2.3 Decommissioning and Reclamation*

The discussion in the Draft Solar PEIS remains valid. Decommissioning and reclamation activities would be of short duration, and their potential air impacts would be minor and temporary.

### 11.3.13.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce air quality impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Limiting dust generation during construction and operations is a required programmatic design feature under BLM's Solar Energy Program. These extensive fugitive dust control measures would keep off-site PM levels as low as possible during construction.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for air quality have been identified for the proposed Dry Lake SEZ. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

**TABLE 11.3.13.2-2 Annual Emissions from Combustion-Related Power Generation Avoided by Full Solar Development of the Proposed Dry Lake SEZ as Revised**

| Area Size (acres)[a] | Capacity (MW)[b] | Power Generation (GWh/yr)[c] | Emissions Avoided (tons/yr; $10^3$ tons/yr for $CO_2$)[d] | | | |
|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_x$ | Hg | $CO_2$ |
| 5,717 | 508–915 | 890–1,603 | 1,256–2,261 | 1,077–1,939 | 0.007–0.013 | 691–1,245 |
| Percentage of total emissions from electric power systems in the state of Nevada[e] | | | 2.4–4.2% | 2.4–4.2% | 2.4–4.2% | 2.4–4.2% |
| Percentage of total emissions from all source categories in the state of Nevada[f] | | | 1.9–3.4% | 0.72–1.3% | –[g] | 1.3–2.3% |
| Percentage of total emissions from electric power systems in the six-state study area[e] | | | 0.50–0.90% | 0.29–0.52% | 0.24–0.44% | 0.26–0.47% |
| Percentage of total emissions from all source categories in the six-state study area[f] | | | 0.27–0.48% | 0.04–0.07% | – | 0.08–0.15% |

a To convert acres to $km^2$, multiply by 0.004047.

b It is assumed that the SEZ would eventually have development on 80% of the lands and that a range of 5 acres (0.020 $km^2$) per MW (for parabolic trough technology) to 9 acres (0.036 $km^2$) per MW (power tower, dish engine, and PV technologies) would be required.

c Assumed a capacity factor of 20%.

d Composite combustion-related emission factors for $SO_2$, $NO_x$, Hg, and $CO_2$ of 2.82, 2.42, $1.6 \times 10^{-5}$, and 1,553 lb/MWh, respectively, were used for the state of Nevada.

e Emission data for all air pollutants are for 2005.

f Emission data for $SO_2$ and $NO_x$ are for 2002, while those for $CO_2$ are for 2005.

g A dash indicates not estimated.

Sources: EPA (2009a,b); WRAP (2009).

## 11.3.14 Visual Resources

### 11.3.14.1 Affected Environment

The proposed Dry Lake SEZ as revised (see Figure 11.3.1.1-1) extends approximately 3.75 mi (6.0 km) north–south, is approximately 4.8 mi (7.7 km) wide and includes only the southernmost area of the originally proposed SEZ. In addition, 469 acres (1.9 $km^2$) of floodplain and wetland within the SEZ boundaries have been identified as non-development areas. Because of the reduction in size of the SEZ, the total acreage of the lands visible within the 25-mi (40-km) viewshed of the SEZ has decreased.

In addition, as a result of the boundary changes, the Dry Lake SEZ is now limited to the Mojave Playas Level IV ecoregion in the northeast portion of the SEZ and the Creosote Bush-Dominated Basins Level IV ecoregion in the remainder of the SEZ (Bryce et al. 2003).

The updated VRI map for the SEZ and surrounding lands is shown in Figure 11.3.14.1-1; it provides information collected in BLM's 2010 VRI, which was finalized in October 2011 (BLM 2011a). As shown, the updated VRI values for the SEZ are VRI Class III, indicating relatively moderate visual values, and VRI Class IV, indicating low visual values. The inventory indicates low scenic quality for the SEZ and its immediate surroundings due to the lack of topographic variability, water features, and diversity of color. Positive scenic quality attributes included adjacent scenery. The SEZ, however, is located in an area that contains a high sensitivity due to the adjacent Valley of the Fire State Park Offset and the I-15 transportation corridor.

Lands in the Southern Nevada District Office within the 25-mi (40-km), 650-ft (198-m) viewshed of the revised SEZ include 5,114 acres (20.7 $km^2$) of VRI Class I areas, 12,208 acres (49.4 $km^2$) of VRI Class II areas, 63,453 acres (256.8 $km^2$) of VRI Class III areas, and 32,216 acres (130.4 $km^2$) of VRI Class IV areas.

### 11.3.14.2 Impacts

The reduction in size of the SEZ would substantially diminish the total visual impacts associated with solar energy development in the SEZ. It would limit the total amount of solar facility infrastructure that would be visible and would lessen the geographic extent of the visible infrastructure.

The proposed Dry Lake SEZ, as revised in the Supplement to the Draft Solar PEIS, eliminated approximately 63% of the original SEZ. The resulting visual contrast reduction for any given point within view of the SEZ would vary greatly depending on the viewpoint's distance and direction from the SEZ. Contrast reduction generally would be greatest for viewpoints closest to the portions of the SEZ that were eliminated and especially for those that had broad, wide-angle views of these areas. In general, contrast reductions also would be larger for elevated viewpoints relative to non-elevated viewpoints, because the reduction in area of the solar facilities would be more apparent when looking down at the SEZ than when looking across it.

#### *11.3.14.2.1 Impacts on the Proposed Dry Lake SEZ*

Although the reduction in size of the SEZ discussed in Section 11.3.14.2 would substantially diminish visual contrasts associated with solar development, solar development still would involve major modification of the existing character of the landscape; it likely would dominate the views from most locations within the SEZ. Additional impacts would occur as a result of the construction, operation, and decommissioning of related facilities, such as access roads and electric transmission lines. In general, strong visual contrasts from solar development still would be expected to be observed from viewing locations within the SEZ.

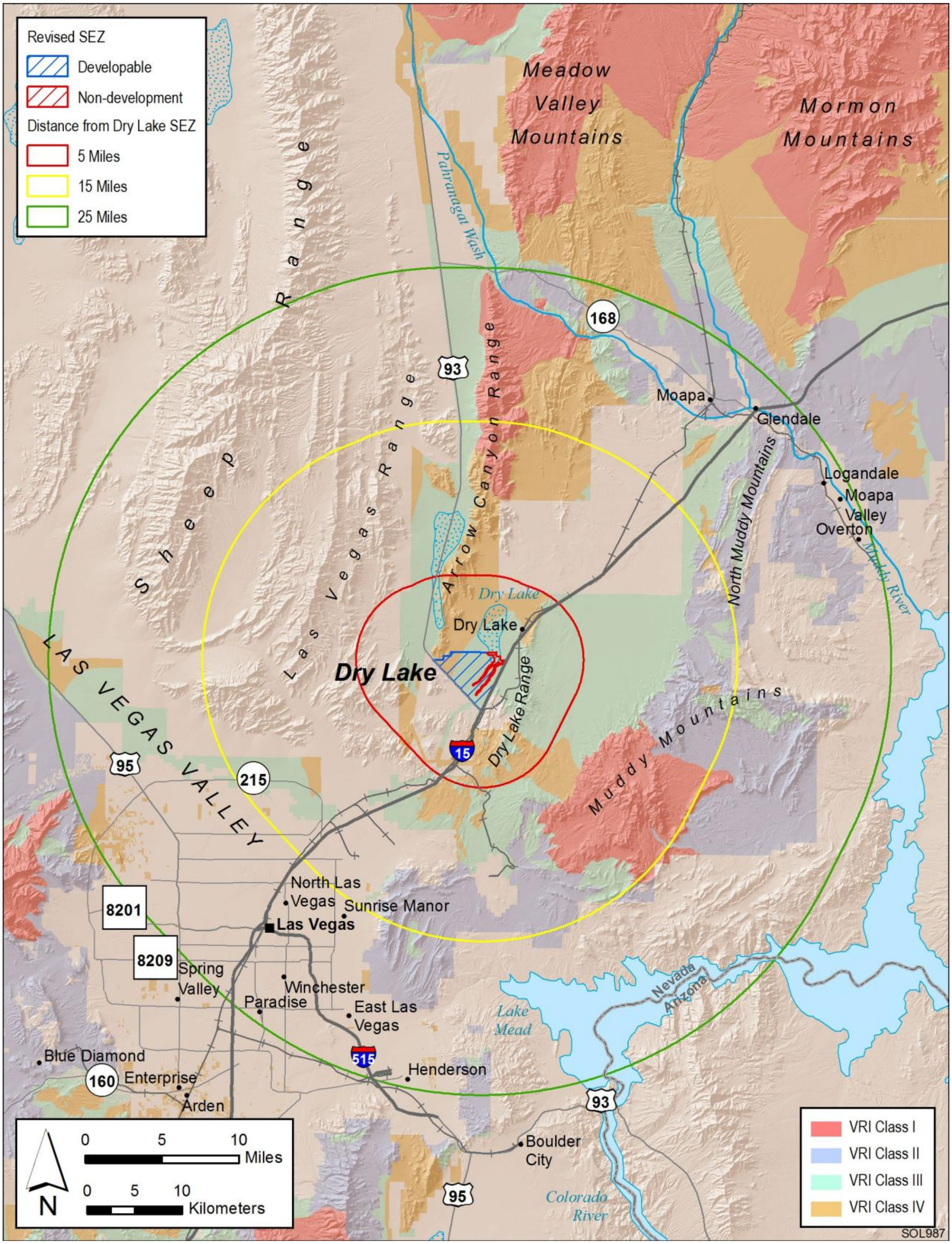


**FIGURE 11.3.14.1-1 Visual Resource Inventory Values for the Proposed Dry Lake SEZ as Revised**

#### *11.3.14.2.2 Impacts on Lands Surrounding the Proposed Dry Lake SEZ*

For the Draft Solar PEIS, preliminary viewshed analyses were conducted to identify which lands surrounding the proposed SEZ could have views of solar facilities in at least some portion of the SEZ (see Appendixes M and N of the Draft Solar PEIS for important information on assumptions and limitations of the methods used). Four viewshed analyses were conducted, assuming four different heights representative of project elements associated with potential solar energy technologies: PV and parabolic trough arrays, 24.6 ft (7.5 m); solar dishes and power blocks for CSP technologies, 38 ft (11.6 m); transmission towers and short solar power towers, 150 ft (45.7 m); and tall solar power towers, 650 ft (198.1 m).

These same viewsheds were recalculated in order to account for the boundary changes described in the Supplement to the Draft Solar PEIS. Figure 11.3.14.2-1 shows the combined results of the viewshed analyses for all four solar technologies. The colored segments indicate areas with clear lines of sight to one or more areas within the SEZ and from which solar facilities within these areas of the SEZ would be expected to be visible, assuming the absence of screening vegetation or structures and adequate lighting and other atmospheric conditions. The light brown areas are locations from which PV and parabolic trough arrays located in the SEZ could be visible. Solar dishes and power blocks for CSP technologies would be visible from the areas shaded in light brown and the additional areas shaded in light purple. Transmission towers and short solar power towers would be visible from the areas shaded light brown, light purple, and the additional areas shaded in dark purple. Power tower facilities located in the SEZ could be visible from areas shaded light brown, light purple, dark purple, and at least the upper portions of power tower receivers from the additional areas shaded in medium brown.

#### *11.3.14.2.3 Impacts on Selected Federal-, State-, and BLM-Designated Sensitive Visual Resource Areas and Other Lands and Resources*

Figure 11.3.14.2-2 shows the results of a GIS analysis that overlays selected federal-, state-, and BLM-designated sensitive visual resource areas onto the combined tall solar power tower (650 ft [198.1 m]) and PV and parabolic trough array (24.6 ft [7.5 m]) viewsheds to illustrate which of these sensitive visual resource areas would have views of solar facilities within the SEZ, and therefore potentially would be subject to visual impacts from those facilities. Distance zones that correspond with BLM's VRM system-specified foreground-middleground distance (5 mi [8 km]), background distance (15 mi [24 km]), and a 25-mi (40-km) distance zone are shown as well in order to indicate the effect of distance from the SEZ on impact levels, which are highly dependent on distance.

A similar analysis was conducted for the Draft Solar PEIS. The scenic resources included in the analysis were as follows:

- National Parks, National Monuments, National Recreation Areas, National Preserves, National Wildlife Refuges, National Reserves, National Conservation Areas, National Historic Sites;

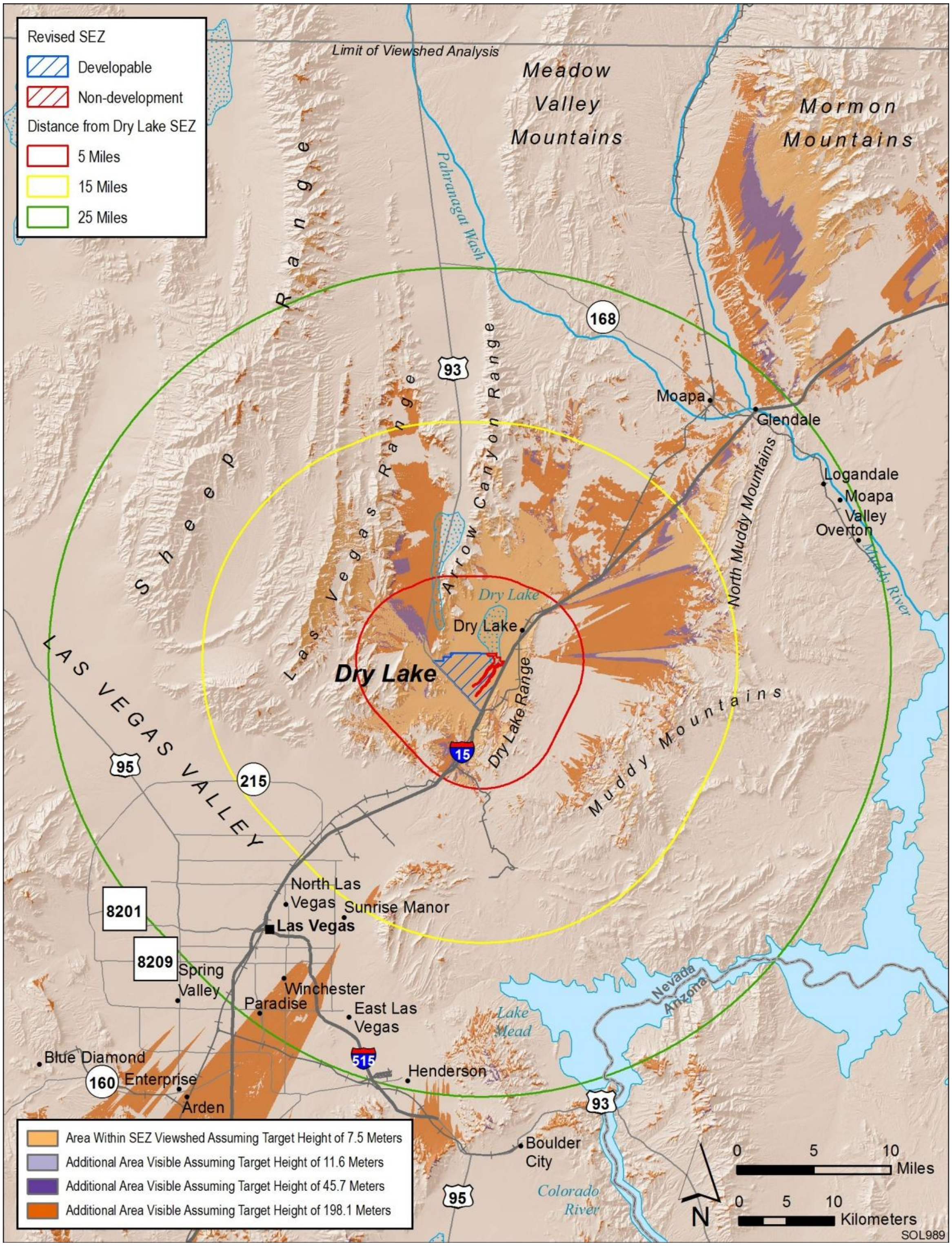


**FIGURE 11.3.14.2-1 Viewshed Analyses for the Proposed Dry Lake SEZ as Revised and Surrounding Lands, Assuming Viewshed Heights of 24.6 ft (7.5 m), 38 ft (11.6 m), 150 ft (45.7 m), and 650 ft (198.1 m) (shaded areas indicate lands from which solar development and/or associated structures within the SEZ could be visible)**

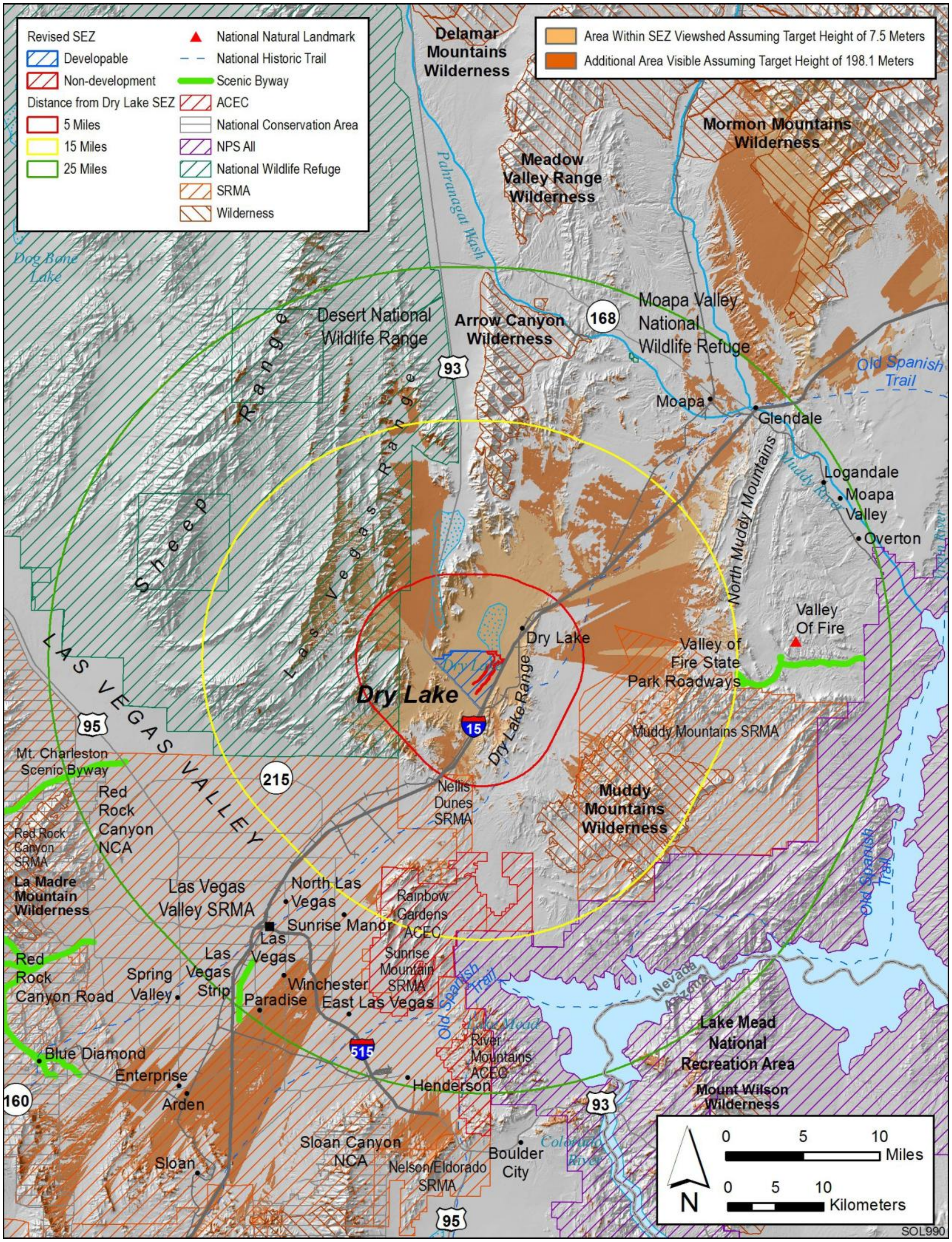


**FIGURE 11.3.14.2-2 Overlay of Selected Sensitive Visual Resource Areas onto Combined 650-ft (198.1-m) and 24.6-ft (7.5-m) Viewsheds for the Proposed Dry Lake SEZ as Revised**

- Congressionally authorized Wilderness Areas;
- Wilderness Study Areas;
- National Wild and Scenic Rivers;
- Congressionally authorized Wild and Scenic Study Rivers;
- National Scenic Trails and National Historic Trails;
- National Historic Landmarks and National Natural Landmarks;
- All-American Roads, National Scenic Byways, State Scenic Highways, and BLM- and USFS-designated scenic highways/byways;
- BLM-designated Special Recreation Management Areas; and
- ACECs designated because of outstanding scenic qualities.

The results of the GIS analyses are summarized in Table 11.3.14.2-1. The change in size of the SEZ alters the viewshed, such that the visibility of the SEZ and solar facilities within the SEZ from the surrounding lands would be reduced.

With the reduction in size of the SEZ, solar energy development within the SEZ would be expected to create minimal or weak visual contrasts for viewers within many of the surrounding scenic resource areas and other resources listed in Table 11.3.14.2-1. Exceptions include the Desert NWR, the Old Spanish National Historic Trail, Arrow Canyon WA, Muddy Mountains WA, and the Nellis Dunes SRMA. In these areas, moderate or strong visual contrasts still could occur.

In addition to these areas, impacts on other lands and resource areas also were evaluated. These areas include I-15, U.S. 93, and the communities of Glendale, Moapa, Paradise, and Winchester.

#### *11.3.14.2.4 Summary of Visual Resource Impacts*

The visual contrast analysis in the Draft Solar PEIS determined that because there could be multiple solar facilities within the Dry Lake SEZ, a variety of technologies employed, and a range of supporting facilities required, solar development within the SEZ would make it essentially industrial in appearance and would contrast strongly with the surrounding, mostly natural-appearing landscape.

The reduction in size of the SEZ substantially diminishes the visual contrast associated with solar facilities as seen both within the SEZ and from surrounding lands in both daytime and

**TABLE 11.3.14.2-1 Selected Potentially Affected Sensitive Visual Resources within a 25-mi (40-km) Viewshed of the Proposed Dry Lake SEZ as Revised, Assuming a Target Height of 650 ft (198.1 m)**

| | | Feature Area or Linear Distance[d] | | |
|---|---|---|---|---|
| | | | Visible Between | |
| Feature Type | Feature Name (Total Acreage/Linear Distance)[a,b,c] | Visible within 5 mi | 5 and 15 mi | 15 and 25 mi |
| National Recreation Area | Lake Mead National Recreation Area (1,105,951 acres) | 0 acres (0%) | 0 acres (0%) | 1,615 acres (0%) |
| National Wildlife Refuge | Desert National (1,626,903 acres) | 6,272 acres (0%) | 22,203 acres (1%) | 4,183 acres (0%) |
| National Historic Trail | Old Spanish[e] (2,700 mi) | 4.2 mi (0%) | 7.2 mi (0%) | 2.1 mi (0%) |
| Wilderness Areas (WAs) | Arrow Canyon (27,521 acres) | 0 acres (0%) | 1,011 acres (4%) | 204 acres (1%) |
| | Muddy Mountains (44,522 acres) | 0 acres (0%) | 3,891 acres (9%) | 0 acres (0%) |
| ACECs | Rainbow Gardens (38,771 acres) | 0 acres (0%) | 644 acres (2%) | 168 acres (0%) |
| | River Mountains (11,029 acres) | 0 acres (0%) | 0 acres (0%) | 1,935 acres (18%) |
| Scenic Byways | Bitter Springs Backcountry (28 mi)[f] | 0 mi (0%) | 7.7 mi (28%) | 0 mi (0%) |
| SRMAs | Las Vegas Valley (447,244 acres) | 0 acres (0%) | 1,238 acres (0%) | 12,433 acres (3%) |
| | Muddy Mountains (128,493 acres) | 0 acres (0%) | 13,561 acres (11%) | 0 acres (0%) |
| | Nellis Dunes (8,924 acres) | 380 acres (4%) | 61 acres (1%) | 0 acres (0%) |
| | Sunrise Mountain (33,322 acres) | 0 acres (0%) | 687 acres (2%) | 168 acres (1%) |

[a] To convert acres to $km^2$, multiply by 0.004047.

[b] To convert mi to km, multiply by 1.609.

[c] Meadow Valley Range WA, Mormon Mountains WA, and the Las Vegas Strip Scenic Byway are not included in this table. These areas were in the viewshed of the original proposed SEZ and were included in the corresponding table in the Draft Solar PEIS; however, these areas are not within the viewshed of the proposed SEZ, as revised.

[d] Percentage of total feature acreage or road length viewable.

[e] Mileage of Old Spanish National Historic Trail (BLM 2011b).

[f] Mileage of Bitter Springs Backcountry Byway (America’s Byways 2012).

nighttime views. The reductions in visual contrast resulting from the boundary changes can be summarized as follows:

- Within the Dry Lake SEZ: Contrasts experienced by viewers in the north and eastern portion of the SEZ would be reduced due to the elimination of 9,463 acres (38.3 $km^2$) of land within the SEZ; however, strong contrasts still would result in the remaining developable area. There would be a small reduction in contrasts in the northwest portion of the SEZ near I-15 due to the designation of non-development lands in the SEZ.

- Lake Mead NRA: A reduction in contrasts would be anticipated due to the slight reduction of the SEZ in the eastern portion; however, solar development within the SEZ still would cause minimal contrast levels.

- Desert NWR: A reduction in contrasts would be anticipated due to the removal of lands in the northern part of the SEZ; however, solar development would still cause weak to strong contrasts, largely in part due to the proximity of the NWR to the SEZ. The NWR is located less than 3 mi (5 km) from the edge of the remaining portion of the SEZ. Strong levels of visual contrast would be expected for some high-elevation viewpoints in the NWR, with weak or moderate levels of visual contrast expected for most lower-elevation viewpoints in the NWR.

- Old Spanish National Historic Trail: A reduction in contrasts would be anticipated due to the removal of lands within the eastern portion of the SEZ (i.e., that area to the east of I-15). However, because of the proximity of the Trail to the SEZ, solar development within the SEZ still would cause minimal to strong contrasts.

- Arrow Canyon WA: A reduction in contrasts would be anticipated due to the elimination of the northern part of the SEZ; expected contrast levels would be lowered from “weak to strong” to “weak to moderate.”

- Meadow Valley Range WA: Meadow Valley Range WA is no longer located within the 25-mi (40-km) viewshed; expected contrast levels would be lowered from “minimal” to “none.”

- Mormon Mountains WA: Mormon Mountains WA is no longer located within the 25-mi (40-km) viewshed; expected contrast levels would be lowered from “minimal” to “none.”

- Muddy Mountains WA: A reduction in contrasts would be anticipated due to the elimination of land to the east of I-15; however, solar development within the SEZ still would cause weak to moderate contrasts.

- Rainbow Gardens ACEC: A reduction in contrasts would be anticipated; solar development within the SEZ still would cause minimal contrasts.

- River Mountains ACEC: A reduction in contrasts would be anticipated; solar development within the SEZ still would cause minimal contrasts.

- Bitter Springs Backcountry Scenic Byway: A reduction in contrasts would be anticipated due to the elimination of acreage in the northern and eastern portions of the SEZ; however, solar development within the SEZ still would cause weak contrasts.

- Las Vegas Strip Scenic Byway: No visual impacts would be expected.

- Las Vegas Valley SRMA: A reduction in contrasts would be anticipated; however, solar development within the SEZ still would cause weak contrasts.

- Muddy Mountains SRMA: A reduction in contrasts would be anticipated due to the elimination of acreage east of I-15 and in the northern portion of the SEZ; expected contrast levels would be lowered from “weak to moderate” to “weak.”

- Nellis Dunes SRMA: A reduction in contrasts would be anticipated; solar development within the SEZ still would cause weak to moderate contrasts.

- Sunrise Mountains SRMA: A reduction in contrasts would be anticipated; however, solar development within the SEZ still would cause minimal contrasts.

- I-15: A reduction in contrasts would be anticipated as the roadway no longer runs through the SEZ; instead, it serves as the eastern boundary of the SEZ, thereby eliminating views of the solar development to the east of the roadway. However, because of the proximity of the roadway to the SEZ, solar development within the SEZ still would cause minimal to strong contrasts. Stronger impacts would be experienced by viewers in areas closer to the SEZ.

- U.S. 93: A reduction in contrasts would be anticipated because of the elimination of the northern portion of the SEZ. However, U.S. 93 still serves as the western-southwestern boundary of the SEZ; in these areas, expected contrasts would be quite strong with contrast lessening as one would travel farther from the SEZ. As a result, however, solar development within the SEZ still would cause minimal to strong contrasts.

- Glendale: The community of Glendale is no longer located within the 25-mi (40-km) viewshed; expected contrast levels would be lowered from “minimal” to “none.”

- Moapa: A reduction in contrasts would be anticipated because of the removal of the northern portion of the SEZ; however, solar development within the SEZ still would cause minimal contrasts.

- Paradise: No visual impacts would be expected.

- Winchester: No visual impacts would be expected.

#### 11.3.14.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on visual resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. While application of the programmatic design features would reduce potential visual impacts somewhat, the degree of effectiveness of these design features can only be assessed at the site- and project-specific level. Given the large scale, reflective surfaces, and strong regular geometry of utility-scale solar energy facilities and the lack of screening vegetation and landforms within the SEZ viewshed, siting the facilities away from sensitive visual resource areas and other sensitive viewing areas would be the primary means of mitigating visual impacts. The effectiveness of other visual impact mitigation measures generally would be limited.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for visual resources have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.3.15 Acoustic Environment

#### 11.3.15.1 Affected Environment

The developable area of the proposed Dry Lake SEZ was reduced from 15,649 acres (63 $km^2$) to 5,717 acres (23 $km^2$); the northern and central portions and the eastern edge of the SEZ proposed in the Draft Solar PEIS were removed. With the change in the proposed boundaries, distances to some of the noise receptors are greater than those presented in the Draft Solar PEIS. Distances to the nearest residences near Nellis Air Force Base remain the same as in the Draft Solar PEIS, but other communities such as Moapa, Moapa Valley, and Overton are now several miles farther from the SEZ.

### 11.3.15.2 Impacts

#### *11.3.15.2.1 Construction*

The noise impact analysis in the Draft Solar PEIS assumed that a maximum of two projects (6,000 acres [24.3 $km^2$]) would be developed at any one time within the SEZ. With the reduction in size of the proposed SEZ, the noise impact analysis for this Final Solar PEIS assumes that only one project (3,000 acres [12.1 $km^2$]) would be under development at a given time. Thus the updated noise predictions in this Final Solar PEIS will be less than those in the Draft Solar PEIS, and except as noted below for wildlife impact in specially designated areas, the conclusions presented in the Draft Solar PEIS remain valid.

The distance from the updated SEZ boundary to the Coyote Springs ACEC did not change (as close as 0.25 mi [0.4 km]), and the predicted construction noise level of 58 dBA at the ACEC boundary still exceeds the typical daytime mean rural background level of 40 dBA. On the basis of comments received and recent references, as applicable, this Final Solar PEIS used an updated approximate significance threshold of 55 dBA, corresponding to the onset of adverse physiological impacts (Barber et al. 2010) to update the analysis of potential noise impacts on terrestrial wildlife in areas of special concern. As discussed in Section 5.10.2 of the Draft and Final Solar PEIS, there is also the potential for other effects (e.g., startle or masking) to occur at lower noise levels (Barber et al. 2011). Considering the approximate significance threshold of 55 dBA and the potential for impacts at lower noise levels, impacts on terrestrial wildlife from construction noise would have to be considered on a site-specific basis, including consideration of site-specific background levels and hearing sensitivity for site-specific terrestrial wildlife of concern.

With the change in SEZ boundaries, the distance to the Old Spanish National Historic Trail has increased to about 2.1 mi (3.4 km), in comparison to the 1.3 mi (2.1 km) presented in the Draft Solar PEIS. Construction noise levels from the SEZ are estimated to be about 34 dBA at the nearest point from the SEZ to the Trail. This level is below the typical daytime mean rural background level of 40 dBA. Noise levels at the Trail are most affected by I-15, which abuts the southeastern SEZ boundary.

Construction noise and vibration impacts on the revised Dry Lake SEZ and SEZ-specific design features would be the same or less than those presented in the Draft Solar PEIS. Construction would cause negligible but unavoidable, localized, short-term noise impacts on neighboring communities.

#### *11.3.15.2.2 Operations*

With the decrease in size of the proposed SEZ, the updated noise impacts estimated in this Final Solar PEIS are less than those presented in the Draft Solar PEIS, and except as noted below for wildlife impacts in specially designated areas, the conclusions presented in the Draft Solar PEIS remain valid.

### Parabolic Trough and Power Tower

Operating parabolic trough or power tower facilities with TES could result in minimal adverse noise impacts on the nearest residences, depending on background noise levels and meteorological conditions. However, noise from such facilities could have some adverse impacts on activities on the Coyote Springs ACEC and the Old Spanish National Historic Trail.

As stated above under construction impacts, for this Final Solar PEIS an updated approximate significance threshold of 55 dBA was used to evaluate potential noise impacts on terrestrial wildlife in areas of special concern. Because there is no change in distance to the Coyote Springs ACEC, estimated noise levels for either a parabolic trough or power tower facility are the same (daytime and nighttime levels of 48 and 58 dBA, respectively). Thus, for these types of facilities, nighttime operations could adversely affect wildlife in the ACEC. Considering these potential impacts and the potential for impacts at lower noise levels, impacts on terrestrial wildlife from operation noise from parabolic trough or power tower facilities operating at nighttime would have to be considered on a project-specific basis, including consideration of site-specific background levels and hearing sensitivity for site-specific terrestrial wildlife of concern.

For either a parabolic trough or power tower facility near the southern SEZ boundary, daytime and nighttime noise levels at the Old Spanish National Historic Trail are estimated to be 35 and 45 dBA, respectively. Operations noise from a solar facility with TES would not be anticipated to affect any daytime activities at the Old Spanish National Historic Trail, but could have some adverse impacts on nighttime activities there. However, a considerable portion of the operation noise might be masked by nearby road traffic on I-15, railroad traffic, and industrial activities along I-15.

### Dish Engines

The reduction in size of the proposed Dry Lake SEZ by about 63% would reduce the number of dish engines by a similar percentage. Noise from a dish engine facility is not anticipated to cause adverse impacts on the nearest residences. However, noise from either type of facility could have some adverse impacts on activities on the Coyote Springs ACEC and the Old Spanish National Historic Trail.

For a dish engine facility, the estimated noise level at the Coyote Springs ACEC is about 52 dBA, 2 dBA lower than the value presented in the Draft Solar PEIS due to reduced area and capacity. This level indicates that adverse effects on wildlife in the ACEC from dish engine facility operations are unlikely. However, considering the potential for impacts at lower noise levels, impacts on terrestrial wildlife from dish engine facility noise would have to be considered on a project-specific basis, including consideration of site-specific background levels and hearing sensitivity for site-specific terrestrial wildlife of concern.

For a dish engine facility which would operate only during daytime hours, the estimated noise level at the Old Spanish National Historic Trail is about 44 dBA. Operations noise from a dish engine facility could have some adverse impacts. However, a considerable portion of the operation noise might be masked by nearby road traffic on I-15, railroad traffic, and industrial activities along I-15.

Changes in the proposed SEZ boundaries would not affect the discussions of vibration, transformer and switchyard noise, and transmission line corona discharge presented in the Draft Solar PEIS. Noise impacts from these sources would be negligible.

##### *11.3.15.2.3 Decommissioning and Reclamation*

The discussion in the Draft Solar PEIS remains valid. Decommissioning and reclamation activities would be of short duration, and their potential impacts would be minor and temporary. Vibration impacts would be lower than those during construction and thus negligible.

#### 11.3.15.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce noise impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some protection from noise impacts.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for noise impacts in the proposed Dry Lake SEZ have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.3.16 Paleontological Resources

#### 11.3.16.1 Affected Environment

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- The change in developable area for the proposed Dry Lake SEZ has eliminated the playa deposits and significantly reduced the residual deposits located on the western edge of the SEZ. The SEZ, as currently configured, consists primarily of alluvial deposits.

- The BLM Regional Paleontologist may have additional information regarding the paleontological potential of the SEZ and be able to verify the PFYC of the SEZ as Class 2 and 3b as used in the Draft Solar PEIS.

#### 11.3.16.2 Impacts

The assessment provided in the Draft Solar PEIS remains valid. Few, if any, impacts on significant paleontological resources are likely to occur in 90% of the proposed Dry Lake SEZ. However, a more detailed look at the geological deposits of the SEZ is needed to determine whether a paleontological survey is warranted.

#### 11.3.16.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on paleontological resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Impacts would be minimized through the implementation of required programmatic design features, including a stop-work stipulation in the event that paleontological resources are encountered during construction, as described in Section A.2.2 of Appendix A.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for paleontological resources have been identified. If the geological deposits are determined to be as described in the Draft Solar PEIS and are classified as PFYC Class 2, mitigation of paleontological resources within most of the Dry Lake SEZ is not likely to be necessary. The need for and nature of any SEZ-specific design features for the remaining portion of the SEZ would depend on the results of future paleontological investigations. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

As additional information on paleontological resources (e.g., from regional paleontologists or from new surveys) becomes available, the BLM will post the data to the project Web site (http://solareis.anl.gov) for use by applicants, the BLM, and other stakeholders.

### 11.3.17 Cultural Resources

#### 11.3.17.1 Affected Environment

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- The distance from the SEZ boundary to the Moapa River Indian Reservation and the Moapa River has increased by about 4 mi (6 km).

- The amount of land subject to archaeological survey in the SEZ has decreased from 60.2%, 9,446 acres (38 $km^2$), to 47.9%, 2,743 acres (11 $km^2$).

- The number of previously recorded cultural resource sites in the SEZ has decreased from 22 to 6. One site is a remnant of the congressionally designated Old Spanish National Historic Trail and is eligible for listing in the NRHP. The eligibility of the other five sites is unknown at this time.

- A tribally approved ethnographic study of the proposed Dry Lake SEZ was conducted (SWCA and University of Arizona 2011), and a summary of that study was presented in the Supplement to the Draft Solar PEIS. A possible site and a number of new cultural landscapes, important water sources, and traditional plants and animals were identified (see Section 11.3.18 for a description of the latter). The completed ethnographic study is available in its entirety on the Solar PEIS Web site (http://solareis.anl.gov).

- The Arrow Canyon Range is directly connected to the Cry Ceremony and the Salt Song Trail, as well as various other songs, stories, and ceremonies of the Southern Paiute Tribe.

- The Moapa River/Muddy River is a source of healing for the Southern Paiute Tribe.

- The Salt Song Trail does pass through the SEZ.

- The members of the Southern Paiute Tribe have farmed and managed mesquite groves in and around the Dry Lake SEZ, and members identified these groves as important cultural features. The Southern Paiute are historically known for their use of irrigated agriculture and the relocation of seeds to new environments, specifically seeds of mesquite trees.

- Additional information may be available to characterize the area surrounding the proposed SEZ in the future (after the Final Solar PEIS is completed), as follows:
  - Results of a Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ, (2) potential trail networks through existing ethnographic reports, and (3) overall cultural sensitivity of the landscape.
  - Verification that the surveys that have been conducted in the SEZ meet current survey standards. If these surveys do meet current survey standards, no Class II surveys would be recommended.
  - Identification of high-potential segments of the Old Spanish National Historic Trail and viewshed analyses from key points along the Trail. High-potential segments of the Trail have been identified just east of the SEZ; however, it is also reported that a portion of the Trail may go through the SEZ.
  - Continuation of government-to-government consultation as described in Section 2.4.3 of the Supplement to the Draft Solar PEIS and IM 2012-032 (BLM 2011c), including follow-up to recent ethnographic studies covering

some SEZs in Nevada and Utah with tribes not included in the original studies to determine whether those tribes have similar concerns.

### 11.3.17.2 Impacts

As stated in the Draft Solar PEIS, direct impacts on significant cultural resources could occur in the proposed Dry Lake SEZ; however, further investigation is needed. Impacts could occur on the known sites in the SEZ, and the Old Spanish National Historic Trail could be affected visually depending on the location of high-potential segments of the Trail. The following updates are based on the revised boundaries of the SEZ:

- Sixteen fewer sites are potentially affected within the reduced footprint of the SEZ.

- Impacts on tribally significant mesquite groves are possible.

### 11.3.17.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce cultural impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Programmatic design features will be applied to address SEZ-specific resources and conditions, for example:

- For projects in the Dry Lake SEZ that are located within the viewshed of the Old Spanish National Historic Trail, a National Trail inventory will be required to determine the area of possible adverse impact on resources, qualities, values, and associated settings of the Trail; to prevent substantial interference; and to determine any areas unsuitable for development. Residual impacts will be avoided, minimized, and/or mitigated to the extent practicable according to program policy standards. Programmatic design features have been included in BLM's Solar Energy Program to address impacts on National Historic Trails (see Section A.2.2.23 of Appendix A).

Programmatic design features also assume that the necessary surveys, evaluations, and consultations will occur.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature for cultural resources has been identified:

- Coordination with the Trail Administration for the Old Spanish Trail and Old Spanish Trail Association is recommended for identifying potential mitigation strategies for avoiding or minimizing potential impacts on the congressionally designated Old Spanish National Historic Trail, and also on any remnants of the NRHP-listed sites associated with the Old Spanish Trail/Mormon Road that may be located within or near the SEZ. Avoidance of the Old Spanish Trail NRHP-listed site within the southeastern portion of the proposed SEZ is recommended.

Additional SEZ-specific design features would be determined in consultation with the Nevada SHPO and affected tribes and would depend on the results of future investigations. Information in the ethnographic reports would suggest that impacts on the Arrow Canyon Range, the Moapa/Muddy River, the Salt Song Trail, and culturally sensitive plant and animal species would need to be avoided, minimized, or otherwise mitigated if solar energy development were to be initiated in the proposed Dry Lake SEZ. Some SEZ-specific design features may be established through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.3.18 Native American Concerns

### 11.3.18.1 Affected Environment

Data presented in the Draft Solar PEIS remain valid, with the following updates:

- A tribally approved ethnographic study of the proposed Dry Lake SEZ was conducted (SWCA and University of Arizona 2011), and a summary of that study was presented in the Supplement to the Draft Solar PEIS. A possible site and a number of new cultural landscapes, important water sources, and traditional plants and animals were identified. The completed ethnographic study is available in its entirety on the Solar PEIS Web site (http://solareis.anl.gov).

- The tribal representatives from the Moapa Band of Paiute Indians believe that all the cultural resources and landscapes within the proposed Dry Lake SEZ are important in helping the Southern Paiute understand their past, present, and future.

- The tribal representatives of the Moapa Band of Paiute Indians believe that the proposed Dry Lake SEZ area should be managed as a spiritual cultural landscape and that areas significant to the Southern Paiute (e.g., Arrow Canyon Range and Potato Woman) should be nominated as traditional cultural properties. The Moapa Band of Paiute Indians would like to work with the BLM in restricting access to the proposed Dry Lake SEZ, as well as the surrounding area, from OHVs and eliminating the use of this area as a shooting range. In addition, the Southern Paiute would like to co-manage the mesquite groves and other traditionally important plant resources within the area, with the BLM (SWCA and University of Arizona 2011).

- The Southern Paiute have identified the Arrow Canyon Range as associated with songs, stories, and ceremonies of the Southern Paiute people as well as home to the Nah'gah, a small variety of mountain sheep that live exclusively within the range. The Nah'gah are created by the Southern Paiute Creator Being and the geological feature Potato Woman, located northeast of the Arrow Canyon Range. Potato Woman has a permanent responsibility to create the Nah'gah, which bring songs, stories, and medicine to the Southern Paiute people and serve as spirit helpers to shaman.

- The Southern Paiute have a spiritual connection to water. They believe that *Puha* (power) follows the flow of water, connecting landscapes and elements associated with those landscapes. The Apex Pleistocene Lake, the Muddy River, the Colorado River, the Virgin River, Hogan Springs, and Warm Springs are identified as important sources of water for the Southern Paiute.

- The Old Spanish Trail holds significance in Southern Paiute history as European movement along this Trail resulted in polluted water, the destruction of many Southern Paiute agricultural areas, and the spread of disease among Native groups in the area. Additional European exploration along this route led to the establishment of the Mormon Road, which led to further decimation of Native American groups and the eventual removal of the Southern Paiute to the Moapa River Indian Reservation.

- Arrow Canyon holds special significance to Southern Paiute peoples because it is home to Tabletop Mountain, where Native Americans from the surrounding area gathered to participate in the Ghost Dance in 1890.

- Mount Charleston, located approximately south–southwest of the SEZ, and Coyote's Jaw, located north of the SEZ in the Pahranagat Range, have been identified as creation places for the Southern Paiute.

- The members of the Southern Paiute Tribe have farmed and managed mesquite groves in and around the Dry Lake SEZ, and members identified these groves as important cultural features. The Southern Paiute are historically known for their use of irrigated agriculture and the relocation of seeds to new environments, specifically seeds of mesquite trees.

- In addition to those listed in Table 11.3.18.1-2 of the Draft Solar PEIS, the following traditional plants have been identified: California barrel cactus (*Ferocactus cylindraceus*), desert globemallow (*Sphaeralcea ambigua*), hedgehog cactus (*Enchinocereus engelmenii*), spiny chorizanthe (*Chorizanthe rigida*), and Western wheatgrass (*Pascopyrum smithii*).

- In addition to those listed in Table 11.3.18.1-3 of the Draft Solar PEIS, the following traditional animals have been identified: coyote (*Canus latrans*), gray fox (*Urocyon cinereoargenteus*), mountain sheep (*Ovis* spp.), white-tailed antelope squirrel (*Spermphilus variegates*), woodrat (*Neotoma* sp.), common raven (*Corvus corax*), American kestrel (*Falco sparverius*), cactus wren (*Campylorhynchus brunneicapillus*), Gambel's quail (*Callipepla gambelii*), great horned owl (*Bubo virginianus*), horned lark (*Eremophilia alpestris*), killdeer (*Charadrius vociferous*), lesser nighthawk (*Chordeiles acutipennis*), loggerhead strike (*Lanius ludovicianus*), rock wren (*Salpinctes obsoletus*), Say's phoebe (*Sayornis saya*), northern mockingbird (*Mimus polyglottos*), red-tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), Western kingbird (*Tyrannus verticalis*), and rattlesnake (*Crotalus* sp.).

### 11.3.18.2 Impacts

The description of potential concerns provided in the Draft Solar PEIS remains valid. During past project-related consultation, the Southern Paiute have expressed concerns about project impacts on a variety of resources, including important food plants, medicinal plants, plants used in basketry, plants used in construction, large game animals, small game animals, birds, and sources of clay, salt, and pigments. While no comments specific to the proposed Dry Lake SEZ have been received from Native American tribes to date, the Paiute Indian Tribe of Utah has asked to be kept informed of Solar PEIS developments.

In addition to the impacts discussed in the Draft Solar PEIS, the ethnographic study conducted for the proposed Dry Lake SEZ identified the following impacts:

- Tribal representatives believe that solar energy development within the Dry Lake SEZ will adversely affect water sources such as the Apex Pleistocene Lake, Muddy River, Colorado River, and Virgin River; geological features such as the Arrow Canyon Range and Potato Woman; important places such as the Salt Song Trail and their mesquite groves; historical sites such as the Old Spanish Trail/Mormon Road, the railroad, Tabletop Mountain in Arrow Canyon, and the Moapa River Reservation; and traditional plant and animal resources (SWCA and University of Arizona 2011).

- OHV access to the area, use of the area as a shooting range, exhaust from the freeway, freeway traffic, the SNWA, and energy from the electrical lines have been identified by tribal representatives of the Moapa Band of Paiute Indians as currently having impacts on cultural resources, cultural landscapes, traditionally important plants and animals, and water sources (SWCA and University of Arizona 2011).

- Development within the proposed Dry Lake SEZ could result in visual impacts on the Arrow Canyon Range and Arrow Canyon. Any impacts on the Arrow Canyon Range directly affect Potato Woman and the Nah'gah because they are all connected.

- Development within the proposed Dry Lake SEZ could affect the Nah'gah's natural habitat and therefore the spiritual nature of the Arrow Canyon Range, Potato Woman, and the stories and medicine of the Southern Paiute.

- Development within the proposed Dry Lake SEZ may affect the spiritual connection that the Southern Paiute have to water, as well as the quantity of water naturally stored in underground aquifers. The Southern Paiute are concerned that energy development within the area will greatly reduce the amount of water that is available to the Tribe and to plants and animals in the valley.

- Development of a project area within the SEZ will directly affect culturally important plant and animal resources because it will likely require the grading of the project area and the possible removal of the mesquite grove.

#### 11.3.18.3 SEZ-Specific Design Features and Design Feature Effectiveness

Tribal representatives believe that solar energy development within the proposed Dry Lake SEZ will adversely affect identified and unidentified archaeological resources; water sources; culturally important geological features; and traditional plant, mineral, and animal resources (SWCA and University of Arizona 2011). Required programmatic design features that would reduce impacts on Native American concerns are described in Section A.2.2 of Appendix A of this Final Solar PEIS. For example, impacts would be minimized through the avoidance of sacred sites, water sources, and tribally important plant and animal species. Programmatic design features require that the necessary surveys, evaluations, and consultations would occur. The affected tribes would be notified regarding the results of archaeological surveys, and they would be contacted immediately upon the discovery of Native American human remains and associated cultural items.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following proposed SEZ-specific design features to address Native American concerns have been identified:

- The Moapa Band of Paiute Indians have specifically requested formal government-to-government contact when construction or land management projects are being proposed on and/or near the Muddy River, the Virgin River, the Colorado River, the Arrow Canyon Range, Potato Woman, and the Apex Pleistocene Lake (SWCA and University of Arizona 2011).

- Compensatory programs of mitigation could be implemented to provide access to and/or deliberately cultivate patches of culturally significant plants, like the mesquite groves present within the Dry Lake SEZ, on other public lands nearby where tribes have ready access.

- In addition, the BLM should consider assisting the Moapa Band of Paiute Indians with the preparation of forms to nominate identified sacred places as traditional cultural properties, if it is found that all the proper eligibility requirements are met.

The need for and nature of additional SEZ-specific design features would be determined during government-to-government consultation with the affected tribes as part of the process of preparing parcels for competitive offer and subsequent project-specific analysis. Potentially significant sites and landscapes in the vicinity of the SEZ associated with the Salt Song and other trails and trail features; the Moapa Valley; water sources, such as the Apex Pleistocene Lake, Muddy River, Colorado River, and Virgin River; geological features, such as the Arrow Canyon Range and Potato Woman; historical sites such as the Old Spanish Trail/Mormon Road, the railroad, Tabletop Mountain in Arrow Canyon, and the Moapa River Reservation; and traditional plant and animal resources, including the mesquite groves, should be considered and discussed during consultation.

## 11.3.19 Socioeconomics

### 11.3.19.1 Affected Environment

Although the boundaries of the Dry Lake SEZ have been reduced compared to the boundaries given in the Draft Solar PEIS, the socioeconomic ROI, the area in which site employees would live and spend their wages and salaries and into which any in-migration would occur, includes the same counties and communities as described in the Draft Solar PEIS, meaning that no updates to the affected environment information given in the Draft Solar PEIS are required.

### 11.3.19.2 Impacts

Socioeconomic resources in the ROI around the SEZ could be affected by solar energy development through the creation of direct and indirect employment and income, generation of direct sales and income taxes, SEZ acreage rental and capacity payments to the BLM, in-migration of solar facility workers and their families, and impacts on local housing markets and community service employment. The impact assessment has been updated in the following sections.

#### *11.3.19.2.1 Solar Trough*

**Construction**

Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of solar trough technologies would be up to 2,921 jobs (Table 11.3.19.2-1).

**TABLE 11.3.19.2-1 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Dry Lake SEZ as Revised with Trough Facilities**

| Parameter | Maximum Annual Construction Impacts[a] | Annual Operations Impacts[b] |
|---|---|---|
| Employment (no.) | | |
| Direct | 1,744 | 199 |
| Total | 2,921 | 300 |
| Income[c] | | |
| Total | 180.8 | 11.3 |
| Direct state taxes[c] | | |
| Sales | 1.2 | 0.2 |
| BLM payments[c,d] | | |
| Rental | NA[e] | 1.1 |
| Capacity[f] | NA | 6.0 |
| In-migrants (no.) | 743 | 25 |
| Vacant housing[g] (no.) | 257 | 16 |
| Local community service employment | | |
| Teachers (no.) | 6 | 0 |
| Physicians (no.) | 2 | 0 |
| Public safety (no.) | 2 | 0 |

a Construction impacts were based on the development at the site in a single year; it was assumed that several facilities with a combined capacity of up to 600 MW (corresponding to 3,000 acres [12 $km^2$] of land disturbance) could be built.

b Operations impacts were based on full build-out of the site, producing a total output of 915 MW.

c Values are reported in $ million 2008.

d There is currently no individual income tax in Nevada.

e NA = not applicable.

f The BLM annual capacity payment was based on a fee of $6,570/MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010), assuming a solar facility with no storage capability and full build-out of the site. Projects with 3 or more hours of storage would generate higher payments, based on a fee of $7,884/MW.

g Construction activities would affect vacant rental housing; operations activities would affect vacant owner-occupied housing.

Construction activities would constitute 0.2% of total ROI employment. A solar facility would also produce $180.8 million in income. Direct sales taxes would be $1.2 million.

Given the scale of construction activities and the low likelihood that the entire construction workforce in the required occupational categories would be available in the local community, construction of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with up to 743 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) in the ROI mean that the impact of solar facility construction on the number of vacant rental housing units would not be expected to be large, with up to 257 rental units expected to be occupied in the ROI. This occupancy rate would represent 0.5% of the vacant rental units expected to be available in the ROI.

In addition to the potential impact on housing markets, in-migration would affect community service employment (education, health, and public safety). An increase in such employment would be required to meet existing levels of service in the ROI. Accordingly, up to six new teachers, two physicians, and two public safety employee (career firefighters and uniformed police officers) would be required in the ROI. These increases would represent less than 0.1% of total ROI employment expected in these occupations.

**Operations**

Total operations employment impacts in the ROI (including direct and indirect impacts) of a full build-out of the SEZ using solar trough technologies would be 300 jobs (Table 11.3.19.2-1). Such a solar facility would also produce $11.3 million in income. Direct sales taxes would be $0.2 million. On the basis of fees established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010), acreage rental payments would be $1.1 million, and solar generating capacity payments would total at least $6.0 million.

As for the construction workforce, operation of a solar facility likely would require some in-migration of workers and their families from outside the ROI, with up to 25 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility operation on the number of vacant owner-occupied housing units would not be expected to be large, with up to 16 owner-occupied units expected to be occupied in the ROI.

No new community service employment would be required to meet existing levels of service in the ROI.

#### *11.3.19.2.2 Power Tower*

**Construction**

Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of power tower technologies would be up to 1,163 jobs (Table 11.3.19.2-2). Construction activities would constitute 0.1% of total ROI employment. Such a solar facility would also produce $72.0 million in income. Direct sales taxes would be $0.5 million.

Given the scale of construction activities and the low likelihood that the entire construction workforce in the required occupational categories would be available in the ROI, construction of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with up to 296 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility construction on the number of vacant rental housing units would not be expected to be large, with up to 102 rental units expected to be occupied in the ROI. This occupancy rate would represent 0.2% of the vacant rental units expected to be available in the ROI.

In addition to the potential impact on housing markets, in-migration would affect community service (education, health, and public safety) employment. An increase in such employment would be required to meet existing levels of service in the ROI. Accordingly, up to three new teachers, one physician, and one public safety employee would be required in the ROI. These increases would represent less than 0.1% of total ROI employment expected in these occupations.

**Operations**

Total operations employment impacts in the ROI (including direct and indirect impacts) of a full build-out of the SEZ using power tower technologies would be 137 jobs (Table 11.3.19.2-2). Such a solar facility would also produce $4.7 million in income. Direct sales taxes would be less than $0.1 million. On the basis of fees established by the BLM (BLM 2010), acreage rental payments would be $1.1 million, and solar generating capacity payments would total at least $3.3 million.

As for the construction workforce, operation of a solar facility likely would require some in-migration of workers and their families from outside the ROI, with up to 36 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility operation on the number of vacant owner-occupied housing units would not be expected to be large, with up to 32 owner-occupied units expected to be required in the ROI.

**TABLE 11.3.19.2-2 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Dry Lake SEZ as Revised with Power Tower Facilities**

| Parameter | Maximum Annual Construction Impacts[a] | Annual Operations Impacts[b] |
|---|---|---|
| Employment (no.) | | |
| Direct | 695 | 103 |
| Total | 1,163 | 137 |
| Income[c] | | |
| Total | 72.0 | 4.7 |
| Direct state taxes[c] | | |
| Sales | 0.5 | <0.1 |
| BLM payments[c,d] | | |
| Rental | NA[e] | 1.1 |
| Capacity[f] | NA | 3.3 |
| In-migrants (no.) | 296 | 13 |
| Vacant housing[g] (no.) | 102 | 8 |
| Local community service employment | | |
| Teachers (no.) | 3 | 0 |
| Physicians (no.) | 1 | 0 |
| Public safety (no.) | 1 | 0 |

a Construction impacts were based on the development at the site in a single year; it was assumed that several facilities with a combined capacity of up to 333 MW (corresponding to 3,000 acres [12 $km^2$] of land disturbance) could be built.

b Operations impacts were based on full build-out of the site, producing a total output of 508 MW.

c Values are reported in $ million 2008.

d There is currently no individual income tax in Nevada.

e NA = not applicable.

f The BLM annual capacity payment was based on a fee of $6,570/MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010), assuming a solar facility with no storage capability and full build-out of the site. Projects with three or more hours of storage would generate higher payments, based on a fee of $7,884/MW.

g Construction activities would affect vacant rental housing; operations activities would affect vacant owner-occupied housing.

No new community service employment would be required to meet existing levels of service in the ROI.

### *11.3.19.2.3 Dish Engine*

**Construction**

Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of dish engine technologies would be up to 473 jobs (Table 11.3.19.2-3). Construction activities would provide less than 0.1% of total ROI employment. Such a solar facility would also produce $29.3 million in income. Direct sales taxes would be $0.2 million.

Given the scale of construction activities and the low likelihood that the entire construction workforce in the required occupational categories would be available in the ROI, construction of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with up to 120 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility construction on the number of vacant rental housing units would not be expected to be large, with up to 42 rental units expected to be occupied in the ROI. This occupancy rate would represent 0.1% of the vacant rental units expected to be available in the ROI.

In addition to the potential impact on housing markets, in-migration would affect community service (education, health, and public safety) employment. An increase in such employment would be required to meet existing levels of service in the ROI. Accordingly, up to one new teacher would be required in the ROI. This increase would represent less than 0.1% of total ROI employment expected in these occupations.

**Operations**

Total operations employment impacts in the ROI (including direct and indirect impacts) of a full build-out of the SEZ using dish engine technologies would be 133 jobs (Table 11.3.19.2-3). Such a solar facility would also produce $4.6 million in income. Direct sales taxes would be less than $0.1 million. On the basis of fees established by the BLM (BLM 2010), acreage rental payments would be $1.1 million, and solar generating capacity payments would total at least $3.3 million.

As for the construction workforce, operation of a dish engine solar facility likely would require some in-migration of workers and their families from outside the ROI, with up to 13 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility

**TABLE 11.3.19.2-3 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Dry Lake SEZ as Revised with Dish Engine Facilities**

| Parameter | Maximum Annual Construction Impacts[a] | Annual Operations Impacts[b] |
|---|---|---|
| Employment (no.) | | |
| Direct | 282 | 100 |
| Total | 473 | 133 |
| Income[c] | | |
| Total | 29.3 | 4.6 |
| Direct state taxes[c] | | |
| Sales | 0.2 | <0.1 |
| BLM payments[c,d] | | |
| Rental | NA[e] | 1.1 |
| Capacity[f] | NA | 3.3 |
| In-migrants (no.) | 120 | 13 |
| Vacant housing[g] (no.) | 42 | 8 |
| Local community service employment | | |
| Teachers (no.) | 1 | 0 |
| Physicians (no.) | 0 | 0 |
| Public safety (no.) | 0 | 0 |

[a] Construction impacts were based on the development at the site in a single year; it was assumed that several facilities with a combined capacity of up to 333 MW (corresponding to 3,000 acres [12 km$^2$] of land disturbance) could be built.

[b] Operations impacts were based on full build-out of the site, producing a total output of 508 MW.

[c] Values are reported in $ million 2008.

[d] There is currently no individual income tax in Nevada.

[e] NA = not applicable.

[f] The BLM annual capacity payment was based on a fee of $6,570/MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010), assuming a solar facility with no storage capability and full build-out of the site. Projects with three or more hours of storage would generate higher payments, based on a fee of $7,884/MW.

[g] Construction activities would affect vacant rental housing; operations activities would affect vacant owner-occupied housing.

operation on the number of vacant owner-occupied housing units would not be expected to be large, with up to 8 owner-occupied units expected to be required in the ROI.

No new community service employment would be required to meet existing levels of service in the ROI.

#### *11.3.19.2.4 Photovoltaic*

**Construction**

Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of PV technologies would be up to 221 jobs (Table 11.3.19.2-4). Construction activities would constitute less than 0.1 % of total ROI employment. Such a solar development would also produce $13.7 million in income. Direct sales taxes would be $0.1 million.

Given the scale of construction activities and the low likelihood that the entire construction workforce in the required occupational categories would be available in the ROI, construction of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with up to 56 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility construction on the number of vacant rental housing units would not be expected to be large, with up to 19 rental units expected to be occupied in the ROI. This occupancy rate would represent less than 0.1% of the vacant rental units expected to be available in the ROI.

No new community service employment would be required to meet existing levels of service in the ROI.

**Operations**

Total operations employment impacts in the ROI (including direct and indirect impacts) of a full build-out of the SEZ using PV technologies would be 13 jobs (Table 11.3.19.2-4). Such a solar facility would also produce $0.5 million in income. Direct sales taxes would be less than $0.1 million. On the basis of fees established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010), acreage rental payments would be $1.1 million, and solar generating capacity payments would total at least $2.7 million.

As for the construction workforce, operation of a PV solar facility would likely require some in-migration of workers and their families from outside the ROI, with up to one person in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the very small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility operation on the number of

**TABLE 11.3.19.2-4 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Dry Lake SEZ as Revised with PV Facilities**

| Parameter | Maximum Annual Construction Impacts[a] | Annual Operations Impacts[b] |
|---|---|---|
| Employment (no.) | | |
| Direct | 132 | 10 |
| Total | 221 | 13 |
| Income[c] | | |
| Total | 13.7 | 0.5 |
| Direct state taxes[c] | | |
| Sales | 0.1 | <0.1 |
| BLM payments[c,d] | | |
| Rental | NA[e] | 1.1 |
| Capacity[f] | NA | 2.7 |
| In-migrants (no.) | 56 | 1 |
| Vacant housing[g] (no.) | 19 | 1 |
| Local community service employment | | |
| Teachers (no.) | 0 | 0 |
| Physicians (no.) | 0 | 0 |
| Public safety (no.) | 0 | 0 |

a Construction impacts were based on the development at the site in a single year; it was assumed that several facilities with a combined capacity of up to 333 MW (corresponding to 3,000 acres [12 km$^2$] of land disturbance) could be built.

b Operations impacts were based on full build-out of the site, producing a total output of 508 MW.

c Values are reported in $ million 2008.

d There is currently no individual income tax in Nevada.

e NA = not applicable.

f The BLM annual capacity payment was based on a fee of $6,570/MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010), assuming a solar facility with no storage capability and full build-out of the site. Projects with three or more hours of storage would generate higher payments, based on a fee of $7,884/MW.

g Construction activities would affect vacant rental housing; operations activities would affect vacant owner-occupied housing.

vacant owner-occupied housing units would not be expected to be large, with up to one owner-occupied unit expected to be required in the ROI.

No new community service employment would be required to meet existing levels of service in the ROI.

#### 11.3.19.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce socioeconomic impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will reduce the potential for socioeconomic impacts during all project phases.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features to address socioeconomic impacts have been identified for the proposed Dry Lake SEZ. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.3.20 Environmental Justice

#### 11.3.20.1 Affected Environment

The data presented in the Draft Solar PEIS are not substantially changed due to the change in boundaries of the proposed Dry Lake SEZ. There are no minority or low-income populations in the Arizona or Nevada portions of the 50-mi (80-km) radius of the SEZ as a whole. There are block groups with minority populations more than 20 percentage points higher than the state average located in the City of Las Vegas, to the west of the downtown area, and in one block group to the northeast of the city. Census block groups within the 50-mi (80-km) radius where the low-income population is more than 20 percentage points higher than the state average are located in the City of Las Vegas, in the downtown area.

#### 11.3.20.2 Impacts

Potential impacts (e.g., from noise and dust during construction and operations, visual impacts, cultural impacts, and effects on property values) on low-income and minority populations could be incurred as a result of the construction and operation of solar facilities involving each of the four technologies. Impacts are likely to be small to moderate, and there are no minority populations defined by CEQ guidelines (CEQ 1997) and no low-income populations (Section 11.3.20.1) within the 50-mi (80-km) radius around the boundary of the

SEZ. This means that any adverse impacts of solar projects would not disproportionately affect minority and/or low-income populations.

### 11.3.20.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce potential environmental justice impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will reduce the potential for environmental justice impacts.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for environmental justice have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.3.21 Transportation

### 11.3.21.1 Affected Environment

The reduction in developable area of the proposed Dry Lake SEZ does not change the information on affected environment provided in the Draft Solar PEIS.

### 11.3.21.2 Impacts

As stated in the Draft Solar PEIS, the primary transportation impacts are anticipated to be from commuting worker traffic. Single projects could involve up to 1,000 workers each day, with an additional 2,000 vehicle trips per day (maximum). The volume of traffic on I-15 would represent an increase in traffic of about 10% in the area of the SEZ. Such traffic levels would represent a 100% increase in the traffic level experienced on U.S. 93 north of its junction with I-15 if all project traffic were routed through U.S. 93. Because higher traffic volumes would be experienced during shift changes, traffic on I-15 could experience minor slowdowns during these time periods near exits in the vicinity of the SEZ where projects are located. Local road improvements would be necessary in the vicinity of exits off I-15 or on any portion of U.S. 93 that might be developed so as not to overwhelm the local access roads near any site access point(s).

Solar development within the SEZ would affect public access along OHV routes that are designated open and available for public use. Although open routes crossing areas granted ROWs for solar facilities could be redesignated as closed (see Section 5.5.1 of the Draft Solar PEIS), a programmatic design feature has been included under Recreation (Section A.2.2.6.1 of Appendix A) that requires consideration of replacement of lost OHV route acreage and of access across and to public lands.

### 11.3.21.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce transportation impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. The programmatic design features, including local road improvements, multiple site access locations, staggered work schedules, and ride-sharing, would all provide some relief to traffic congestion on local roads leading to the SEZ. Depending on the location of solar facilities within the SEZ, more specific access locations and local road improvements could be implemented.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features to address transportation impacts in the proposed Dry Lake SEZ have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.3.22 Cumulative Impacts

The analysis of potential impacts in the vicinity of the proposed Dry Lake SEZ presented in the Draft Solar PEIS is still generally applicable for this Final Solar PEIS, although the impacts would be decreased because the size of the developable area of the proposed SEZ has been reduced to 5,717 acres (23 km$^2$). The following sections include an update to the information presented in the Draft Solar PEIS regarding cumulative effects for the proposed Dry Lake SEZ.

### 11.3.22.1 Geographic Extent of the Cumulative Impact Analysis

The geographic extent of the cumulative impact analysis has not changed. The extent varies on the basis of the nature of the resource being evaluated and the distance at which the impact may occur (e.g., air quality impacts may have a greater geographic extent than impacts on visual resources). The BLM, USFWS, NPS, and DoD administer most of the land around the SEZ; there are also some nearby tribal lands at the Moapa River Indian Reservation adjacent to the northeast boundary of the SEZ. The BLM administers approximately 45.4% of the lands within a 50-mi (80-km) radius of the SEZ.

### 11.3.22.2 Overview of Ongoing and Reasonably Foreseeable Future Actions

The proposed Dry Lake SEZ decreased from 15,649 acres (63 km$^2$) to 6,186 acres (25 km$^2$, with an additional 460 acres (1.9 km$^2$) within the SEZ identified as non-development areas. The Draft Solar PEIS included six other proposed SEZs in Nevada. Two of these, Delamar Valley and East Mormon Mountain, have been removed from consideration.

There are 12 pending ROW applications for solar facilities within 50 mi (80 km) of the Dry Lake SEZ that could generate up to 4,145 MW of electricity on public lands in Nevada (see the full list of pending applications in Table B-1 of Appendix B of this Final Solar PEIS). However, these applications are in various stages of approval, and environmental assessments have not been completed. As of the end of October 2011, these 12 pending solar applications were not considered reasonably foreseeable future actions.

The ongoing and reasonably foreseeable future actions described below are grouped into two categories: (1) actions that relate to energy production and distribution (Section 11.3.22.2.1); and (2) other ongoing and reasonably foreseeable actions, including those related to electric power generation, water management, natural gas and petroleum distribution, communication systems, residential development, and mining (Section 11.3.22.2.2). Together, these actions and trends have the potential to affect human and environmental receptors within the geographic range of potential impacts over the next 20 years.

#### *11.3.22.2.1 Energy Production and Distribution*

The list of reasonably foreseeable future actions that relate to energy production and distribution, including potential solar energy projects under the proposed action, near the proposed Dry Lake SEZ has been updated and is presented in Table 11.3.22.2-1. Projects listed in the table are shown in Figure 11.3.22.2-1. Most of these projects were described in the Draft Solar PEIS; projects not described there are discussed below.

**Moapa Solar Project**

K Road Power proposes to construct and operate a 350-MW PV power plant on a 2,153-acre (8.7-km$^2$) site located on the Moapa River Indian Reservation, approximately 5 mi (8 km) east of the proposed Dry Lake SEZ. The project also includes the construction and operation of an 8-mi (13-km) long, up to 500-kV transmission line to the Crystal Substation; a 1-mi (1.6-km) water pipeline; and a 3-mi (5-km) long, 12-kV transmission line linking the Moapa Travel Plaza to the proposed project substation.

The proposed facility would have an estimated water requirement of 72 ac-ft/yr (88,800 m$^3$/yr) during construction and up to 20 to 40 ac-ft/yr (25,000 to 50,000 m$^3$/yr) of water during operation. Water will be drawn from an on-site well. Construction of the facility will require approximately 400 workers at the peak of construction. Operation and maintenance of the facility will require 35 full-time workers (BLM 2011d). A Desert Tortoise Relocation Plan will be instituted to remove the tortoises prior to construction and move them to suitable habitat on the reservation.

**TABLE 11.3.22.2-1 Ongoing and Reasonably Foreseeable Future Actions Related to Energy Development and Distribution near the Proposed Dry Lake SEZ as Revised[a]**

| Description | Status | Resources Affected | Primary Impact Location |
|---|---|---|---|
| ***Renewable Energy Projects on BLM-Administered lands*** | | | |
| Mohave County Wind Farm (AZA 32315), 500 MW, 31,338 acres[b] | **NOI No. 2, July 26, 2010 Plan of Development August 10, 2010[c]** | Terrestrial habitats, wildlife cultural resources, land use | 40 mi[d] southeast of the SEZ in Arizona |
| ***Renewable Energy Projects on Private Lands*** | | | |
| **Copper Mountain Solar 2** (Boulder City Solar), 150-MW PV, 1,100 acres | **Construction to begin in early 2012[e]** | Terrestrial habitats, wildlife, cultural resources, land use | 40 mi south of the SEZ |
| **Copper Mountain Solar 1** (El Dorado Solar Expansion), **48-MW** PV, **380 acres** | **Operating[f]** | Terrestrial habitats, wildlife, cultural resources, land use | 45 mi south of the SEZ |
| **Moapa Solar Project (NVN-89176), 350-MW PV, 2,153 acres, transmission line requires BLM ROW authorization** | **DEIS November 2011[g]** | **Terrestrial habitats, wildlife, cultural resources, land use** | **5 mi east of the SEZ** |
| BrightSource Coyote Springs Project, **400-MW** solar tower, 7,680 acres | Planning stage | Terrestrial habitats, vegetation, wildlife, soil, water, visual, cultural | 15 mi north of the SEZ |
| BrightSource Overton Project, 400-MW solar tower | Planning stage | Terrestrial habitats, vegetation, wildlife, soil, water, visual, cultural | 30 mi northeast of the SEZ |
| ***Transmission and Distribution Systems*** | | | |
| One Nevada Transmission Line Project | **ROD March 1, 2011[h]** | Disturbed areas, terrestrial habitats along transmission line ROW | Corridor passes through the SEZ |
| Southwest Intertie Project | FONSI July 30, 2008; FEIS January 2010[i] **Under construction; expected first operation 2012** | Disturbed areas, terrestrial habitats along transmission line ROW | Corridor passes through the SEZ |

**TABLE 11.3.22.2-1 (Cont.)**

| Description | Status | Resources Affected | Primary Impact Location |
|---|---|---|---|
| ***Transmission and Distribution Systems (Cont.)*** | | | |
| TransWest Transmission Project | **NOI January 4, 2011**[j] | Disturbed areas, terrestrial habitats along transmission line ROW | Corridor passes through the SEZ |
| Zephyr and Chinook Transmission Line Project | **Permit Applications January 28, 2011**[k] | Disturbed areas, terrestrial habitats along transmission line ROW | Corridor passes near or through the SEZ |

[a] Includes projects in later stages of agency environmental review and project development. For projects on BLM-administered lands, includes those approved in 2010 and priority projects for 2011 and 2012 (see BLM 2012b). Projects with status changed from that given in the Draft Solar PEIS are shown in bold text.

[b] To convert acres to km$^2$, multiply by 0.004047.

[c] See BP Wind Energy North America Inc. (2011) for details.

[d] To convert mi to km, multiply by 1.609.

[e] See Sempra U.S. Gas & Power (2012a) for details.

[f] See Sempra U.S. Gas & Power (2012b) for details.

[g] See BLM (2011d) for details.

[h] See BLM (2011e) for details.

[i] See Western (2010) for details.

[j] See BLM (2011f) for details.

[k] See TransCanada (2011) for details.

#### *11.3.22.2.2 Other Actions*

A number of energy production facilities are located within a 50-mi (80-km) radius from the center of the Dry Lake SEZ, which includes portions of Clark and Lincoln Counties in Nevada, Washington County in Utah, and Mohave County in Arizona. Other major ongoing and foreseeable actions within 50 mi (80 km) of the proposed Dry Lake SEZ have been updated and are listed in Table 11.3.22.2-2. These projects were described in the Draft Solar PEIS.

### 11.3.22.3 General Trends

The information on general trends presented in the Draft Solar PEIS remains valid.

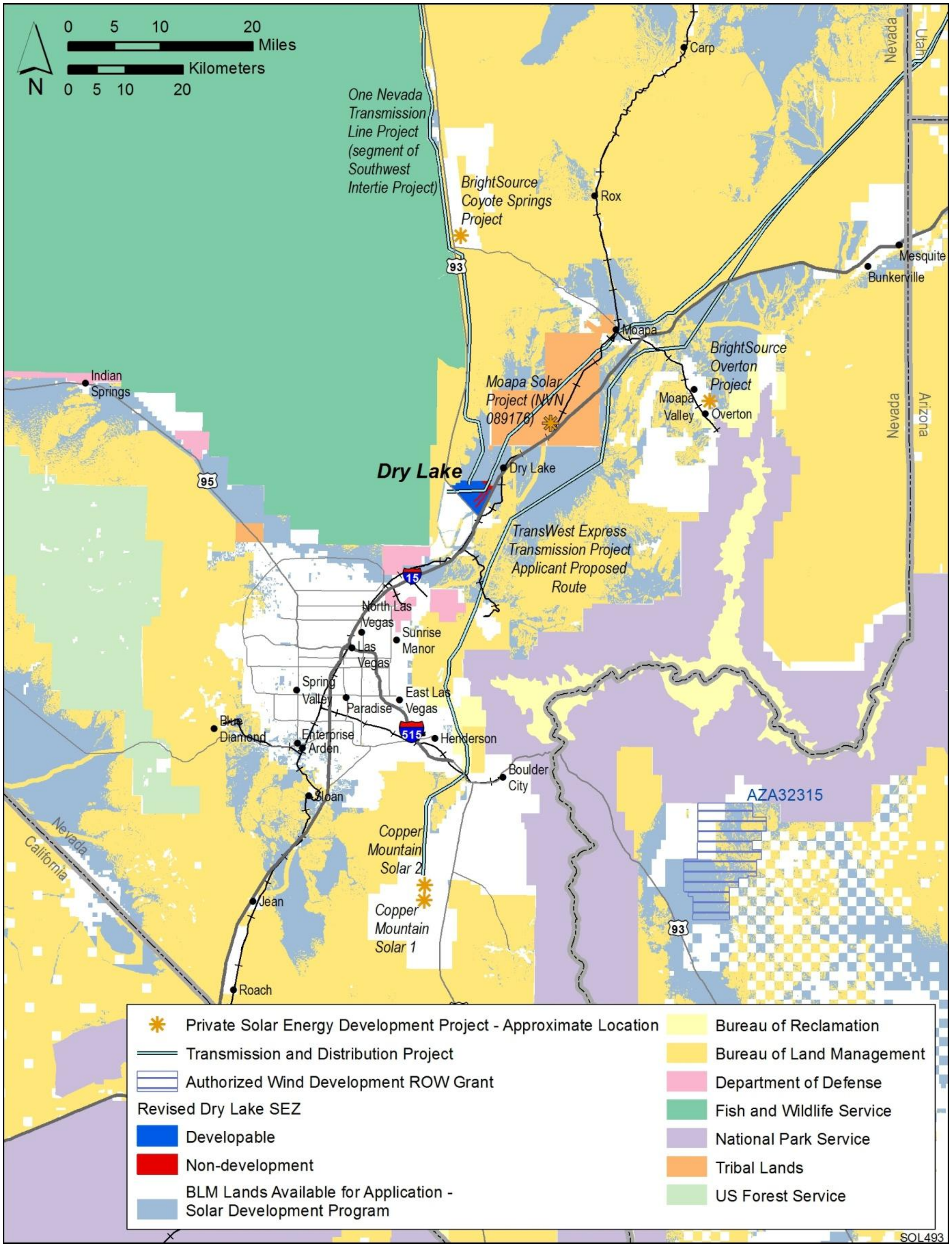


**FIGURE 11.3.22.2-1 Locations of Existing and Reasonably Foreseeable Renewable Energy Projects on Public Land within a 50-mi (80-km) Radius of the Proposed Dry Lake SEZ as Revised**

**TABLE 11.3.22.2-2  Other Ongoing and Foreseeable Actions near the Proposed Dry Lake SEZ as Revised[a]**

| Description | Status | Resources Affected | Primary Impact Location[b] |
|---|---|---|---|
| ***Renewable Energy Projects*** | | | |
| El Dorado Solar | Operating since 2009 | Terrestrial habitats, wildlife, visual | 45 mi south of the SEZ |
| Nellis Air Force Base Solar | Operating since 2007 | Terrestrial habitats, wildlife, visual | 10 mi south of the SEZ |
| Nevada Solar One | Operating since 2007 | Terrestrial habitats, wildlife, water, cultural, visual | 40 mi south of the SEZ |
| Sithe Global Flat Top Mesa Solar | Proposed | Terrestrial habitats, wildlife, cultural, visual | 42 mi northeast of the SEZ |
| ***Other Energy Projects*** | | | |
| Apex Generating Station | Operating since 2003 | Terrestrial habitats, wildlife, water, air, cultural, visual | Adjacent to the SEZ |
| Chuck Lenzie Generating Station | Operating since 2006 | Terrestrial habitats, wildlife, water, air, cultural, visual | Adjacent to the SEZ |
| Edward W. Clark Generating Station | Operating since 1973 | Terrestrial habitats, wildlife, water, air, cultural, visual | 25 mi southwest of the SEZ |
| El Dorado Energy Generating Station | Operating since 2000 | Terrestrial habitats, wildlife, water, air, cultural, visual | 45 mi south of the SEZ |
| Goodsprings Waste Heat Recovery Facility | EA and FONSI September 2009 | Threatened and endangered species, air, visual | 50 mi southwest of the SEZ |
| Harry Allen Generating Station | Operating since early 1980s | Terrestrial habitats, wildlife, water, air, cultural, visual | Within the SEZ |
| Harry Allen Expansion | Under construction | Terrestrial habitats, wildlife, water, air, cultural, visual | Within the SEZ |

**TABLE 11.3.22.2-2 (Cont.)**

| Description | Status | Resources Affected | Primary Impact Location |
|---|---|---|---|
| ***Other Energy Projects (Cont.)*** | | | |
| Reid Gardner Generating Station | Operating since 1965 | Terrestrial habitats, wildlife, water, air, cultural, visual | 20 mi northeast of the SEZ |
| Reid Gardner Expansion | EA and FONSI March 2008 | Terrestrial habitats, wildlife, soil, air, water | 20 mi northeast of the SEZ |
| Saguaro Power Company | Operating since 2000 | Terrestrial habitats, wildlife, water, air, cultural, visual | 20 mi south of the SEZ |
| Silverhawk Generating Station | Operating since 2004 | Terrestrial habitats, wildlife, water, air, cultural, visual | Adjacent to the SEZ |
| Sunrise Generating Station | Operating since 1964 | Terrestrial habitats, wildlife, water, air, cultural, visual | 20 mi south of the SEZ |
| Toquop Energy Project | Coal-fired plant FEIS 2009, changed to natural gas in 2010 | Terrestrial habitats, wildlife, soil, water, air, cultural, visual | 50 mi northeast of the SEZ |
| ***Distribution Systems*** | | | |
| Kern River Gas Transmission System | Operating since 1992 | Disturbed areas, terrestrial habitats along pipeline ROW | Corridor passes through the SEZ |
| UNEV Pipeline Project | FEIS April 2010, **under construction** | Disturbed areas, terrestrial habitats along pipeline ROW | Corridor passes through the SEZ |
| ***Other Projects*** | | | |
| Arizona Nevada Tower Corporation Communication Sites | EA issued April 2007 | Terrestrial habitats, wildlife, cultural resources | West and north of the SEZ |

**TABLE 11.3.22.2-2  (Cont.)**

| Description | Status | Resources Affected | Primary Impact Location |
|---|---|---|---|
| ***Other Projects (Cont.)*** | | | |
| Clark, Lincoln, and White Pine Counties Groundwater Development Project | **DEIS June 2011** | Terrestrial habitats, wildlife, groundwater | Within the SEZ |
| **Coyote Springs Investment Planned Development Project** | FEIS Sept. 2008, ROD October 2008 | Terrestrial habitats, wildlife, water, socioeconomics | 15 mi north of the SEZ |
| Dry Lake Groundwater Testing/ Monitoring Wells | EA and FONSI September 2009 | Terrestrial habitats, wildlife cultural resources | Within the SEZ |
| Lincoln County Land Act Groundwater Development and Utility ROW | FEIS May 2009, ROD January 2010 | Terrestrial habitats, wildlife, groundwater | 45 mi northeast of the SEZ |
| Meadow Valley Gypsum Project | EA and FONSI 2008 | Terrestrial habitats, wildlife, soils, socioeconomics | 35 mi northeast of the SEZ |
| Mesquite Nevada General Aviation Replacement Airport | DEIS April 2008**, project cancelled**[c] | Land use, terrestrial habitats, wildlife, soil, water, air, cultural, visual | 40 mi northeast of the SEZ |
| **NV Energy Microwave and Mobile Radio Project** | **Draft FONSI July 2010** | Terrestrial habitats, wildlife, cultural resources | Two sites within the SEZ, one site 45 mi north of the SEZ |

[a] Projects with status changed from that given in the Draft Solar PEIS are shown in bold text.

[b] To convert mi to km, multiply by 1.609.

[c] See FAA (2011) for details.

### 11.3.22.4 Cumulative Impacts on Resources

Total disturbance over 20 years in the proposed Dry Lake SEZ would be about 4,574 acres (18.5 $km^2$) (80% of the developable area of the proposed SEZ). This development would contribute incrementally to the impacts from other past, present, and reasonably foreseeable future actions in the region as described in the Draft Solar PEIS. Primary impacts from development in the Dry Lake SEZ may include impacts on water quantity and quality, air quality, ecological resources such as habitat and species, cultural and visual resources, and specially designated lands.

Activities in the region that will contribute to cumulative impacts include one additional solar PV project that was not addressed in the Draft Solar PEIS: the proposed Moapa Solar Project (350 MW) located 5 mi (8 km) east of the SEZ on a 2,153-acre (8.7-$km^2$) site on the Moapa River Indian Reservation. The proposed facility would have an estimated water requirement of 72 ac-ft/yr (88,800 $m^3$/yr) during construction and up to 20 to 40 ac-ft/yr (25,000 to 50,000 $m^3$/yr) of water during operations. Water will be drawn from an on-site well. A Desert Tortoise Relocation Plan will be instituted to remove the tortoises prior to construction and move them to suitable habitat on the reservation. The Mesquite Replacement Airport, which would have required the BLM to release 2,560 acres (10.4 $km^2$) to the City of Mesquite, has been cancelled. The Coyote Springs Development has not yet begun, and if it does not become a reality, then the estimated 70,000 ac-ft/yr (86 million $m^3$/yr) would not be needed and the 21,454 acres (86.8 $km^2$) would potentially remain undeveloped. In addition, this is desert tortoise habitat, and relocations would not be required if the development does not occur.

Overall, the incremental cumulative impacts associated with the development in the proposed Dry Lake SEZ during construction, operation, and decommissioning are expected to be less than those provided in the Draft Solar PEIS. This is because the proposed Dry Lake SEZ decreased from 15,649 acres (63 $km^2$) to 6,186 acres (25 $km^2$), an additional 460 acres (1.9 $km^2$) within the SEZ were identified as non-development areas, and the Mesquite Replacement Airport project was cancelled.

## 11.3.23 Transmission Analysis

The methodology for this transmission analysis is described in Appendix G of this Final Solar PEIS. This section presents the results of the transmission analysis for the Dry Lake SEZ, including the identification of potential load areas to be served by power generated at the SEZ and the results of the DLT analysis. Unlike Sections 11.3.2 through 11.3.22, this section is not an update of previous analysis for the Dry Lake SEZ; this analysis was not presented in the Draft Solar PEIS. However, the methodology and a test case analysis were presented in the Supplement to the Draft. Comments received on the material presented in the Supplement were used to improve the methodology for the assessment presented in this Final Solar PEIS.

On the basis of its size, the assumption of a minimum of 5 acres (0.02 $km^2$) of land required per MW, and the assumption of a maximum of 80% of the land area developed, the

Dry Lake SEZ is estimated to have the potential to generate 915 MW of marketable solar power at full build-out.

### 11.3.23.1 Identification and Characterization of Load Areas

The primary candidates for Dry Lake SEZ load areas are the major surrounding cities. Figure 11.3.23.1-1 shows the possible load areas for the Dry Lake SEZ and the estimated portion of their market that could be served by solar generation. Possible load areas for the Dry Lake SEZ include Phoenix, Arizona; Salt Lake City, Utah; Las Vegas and Reno, Nevada; and Los Angeles, San Jose, San Francisco, Oakland, and Sacramento, California.

The two load area groups examined for the Dry Lake SEZ are as follows:

1. Las Vegas, Nevada; and

2. Los Angeles, California; and Phoenix, Arizona.

Figure 11.3.23.1-2 shows the most economically viable transmission scheme for the Dry Lake SEZ (transmission scheme 1), and Figure 11.3.23.1-3 shows an alternative transmission

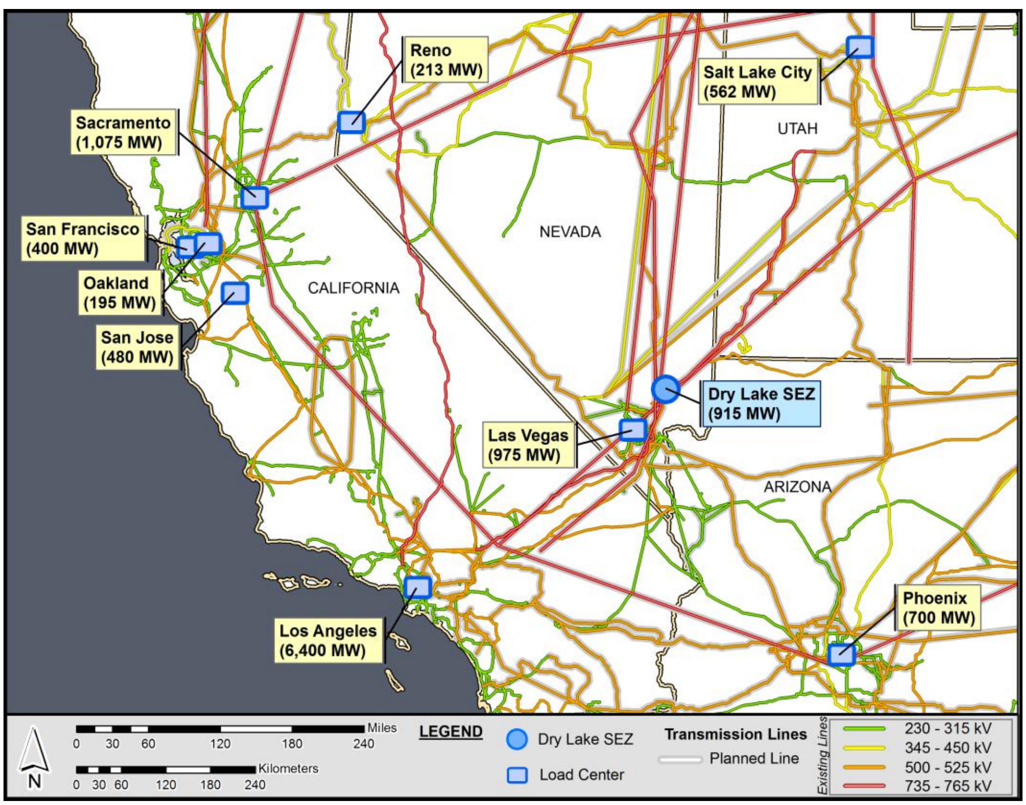


**FIGURE 11.3.23.1-1 Location of the Proposed Dry Lake SEZ and Possible Load Areas (Source for background map: Platts 2011)**

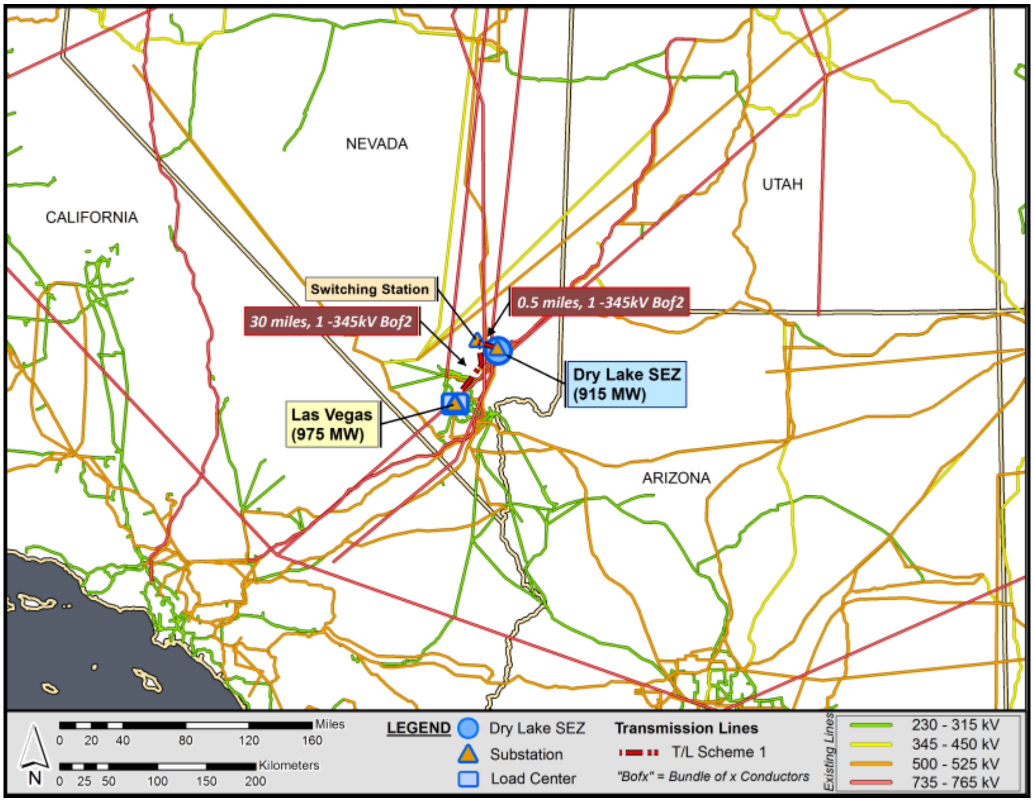


**FIGURE 11.3.23.1-2 Transmission Scheme 1 for the Proposed Dry Lake SEZ (Source for background map: Platts 2011)**

scheme (transmission scheme 2) that represents a logical choice should transmission scheme 1 be infeasible. As described in Appendix G, the alternative shown in transmission scheme 2 represents the optimum choice if one or more of the primary linkages in transmission scheme 1 are excluded from consideration. The groups provide for linking loads along alternative routes so that the SEZ's output of 915 MW could be fully allocated.

Table 11.3.23.1-1 summarizes and groups the load areas according to their associated transmission scheme and provides details on how the megawatt load for each area was estimated.

### 11.3.23.2 Findings for the DLT Analysis

The DLT analysis approach assumes that the Dry Lake SEZ will require all new construction for transmission lines (i.e., dedicated lines) and substations. The new transmission lines(s) would directly convey the 915-MW output of the Dry Lake SEZ to the prospective load areas for each possible transmission scheme. The approach also assumes that all existing transmission lines in the WECC region are saturated and have little or no available capacity to accommodate the SEZ's output throughout the entire 10-year study horizon.


**FIGURE 11.3.23.1-3 Transmission Scheme 2 for the Proposed Dry Lake SEZ (Source for background map: Platts 2011)**

**TABLE 11.3.23.1-1 Candidate Load Area Characteristics for the Proposed Dry Lake SEZ**

| Transmission Scheme | City/Load Area Name | Position Relative to SEZ | 2010 Population[c] | Estimated Total Peak Load (MW) | Estimated Peak Solar Market (MW) |
|---|---|---|---|---|---|
| 1 | Las Vegas, Nevada[a] | Southwest | 1,950,000 | 4,875 | 975 |
| 2 | Los Angeles, California[a] | Southwest | 12,800,000 | 32,072 | 6,400 |
| | Phoenix, Arizona[b] | Southeast | 1,400,000 | 3,500 | 700 |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

[c] City and metropolitan area population data are from 2010 Census data (U.S. Bureau of the Census 2010).

Figures 11.3.23.1-2 and 11.3.23.1-3 display the pathways that new dedicated lines might follow to distribute solar power generated at Dry Lake SEZ via the two identified transmission schemes described in Table 11.3.23.1-1. These pathways parallel existing 500-, 345-, 230-kV, and/or lower voltage lines. The intent of following existing lines is to avoid pathways that may be infeasible due to topographical limitations or other concerns.

For transmission scheme 1, a new line would be constructed to connect with Las Vegas (975 MW), so that the 915-MW output of the Dry Lake SEZ could be fully utilized (Figure 11.3.23.1-2). This particular scheme has two segments. The first segment extends to the northwest from the SEZ to the first switching station over a distance of about 0.5 mi (0.8 km). This segment would require a single-circuit 345-kV (1–345 kV) bundle of two conductors (Bof2) transmission line design based on engineering and operational considerations. The second and final leg runs about 30 mi (48 km) from the first switching station to Las Vegas. In general, the transmission configuration options were determined by using the line “loadability” curve provided in American Electric Power’s *Transmission Facts* (AEP 2010). Appendix G documents the line options used for this analysis and describes how the load area groupings were determined.

Transmission scheme 2, which for the purpose of analysis assumes the Las Vegas market is not available, serves load centers to the south and southwest. Figure 11.3.23.1-3 shows that new lines would be constructed to connect with Los Angeles (6,400 MW) and Phoenix (700 MW), so that the 915-MW output of the Dry Lake SEZ could be fully utilized. This scheme has four segments. The first segment extends northwesterly from the SEZ to the first switching station over a distance of about 0.5 mi (0.8 km). This segment would require a single-circuit 500-kV (1-500 kV) bundle of three conductors (Bof3) transmission line design. The second leg runs about 30 mi (48 km) from the first switching station to the Las Vegas switching station, while the third leg extends from the Las Vegas switching station about 280 mi (451 km) to Los Angeles (6,400 MW). The fourth and final segment runs from the Las Vegas Switching Station to Phoenix (700 MW) for a distance of 294 mi (473 km).

Table 11.3.23.2-1 summarizes the distances to the various load areas over which new transmission lines would need to be constructed, as well as the assumed number of substations that would be required. One substation is assumed to be installed at each load area and an additional one at the SEZ. In general, the total number of substations per scheme is simply equal to the number of load areas associated with the scheme plus one. Substations at the load areas would consist of one or more step-down transformers, while the originating substation at the SEZ would consist of several step-up transformers. The originating substation would have a rating of at least 915 MW (to match the plant’s output), while the combined load substations would have a similar total rating of 915 MW. For schemes that require the branching of the lines, a switching substation is assumed to be constructed at the appropriate junction. In general, switching stations carry no local load but are assumed to be equipped with switching gears (e.g., circuit breakers and connecting switches) to reroute power as well as, in some cases, with additional equipment is installed to regulate voltage.

Table 11.3.23.2-2 provides an estimate of the total land area disturbed for construction of new transmission facilities under each of the schemes evaluated. The most favorable

**TABLE 11.3.23.2-1 Potential Transmission Schemes, Estimated Solar Markets, and Distances to Load Areas for the Proposed Dry Lake SEZ**

| Transmission Scheme | City/Load Area Name | Estimated Peak Solar Market (MW)[c] | Total Solar Market (MW) | Sequential Distance (mi)[d] | Total Distance (mi)[d] | Line Voltage (kV) | No. of Substations |
|---|---|---|---|---|---|---|---|
| 1 | Las Vegas, Nevada[a] | 975 | 975 | 30.5 | 31 | 345 | 3 |
| 2 | Los Angeles, California[a]<br>Phoenix, Arizona[b] | 6,400<br>700 | 7,100 | 280<br>324.5 | 605 | 500,<br>138 | 5 |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

[c] From Table 11.3.23.1-1.

[d] To convert mi to km, multiply by 1.6093.

**TABLE 11.3.23.2-2 Comparison of the Various Transmission Line Configurations with Respect to Land Use Requirements for the Proposed Dry Lake SEZ**

| | | | | Land Use (acres)[d] | | |
|---|---|---|---|---|---|---|
| Transmission Scheme | City/Load Area Name | Total Distance (mi)[c] | No. of Substations | Transmission Line | Substation | Total |
| 1 | Las Vegas, Nevada[a] | 30.5 | 3 | 647.0 | 22.0 | 669.0 |
| 2 | Los Angeles, California[a]<br>Phoenix, Arizona[b] | 311<br>294 | 5 | 2,850.9 | 22.0 | 2,872.9 |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

[c] To convert mi to km, multiply by 1.6093.

[d] To convert acres to km$^2$, multiply by 0.004047.

transmission scheme with respect to minimizing costs and the area disturbed would be scheme 1, which would serve Las Vegas. This scheme is estimated to potentially disturb about 669 acres (2.7 km$^2$) of land. The less favorable transmission scheme with respect to minimizing costs and the area disturbed would be scheme 2 (serving Los Angeles and Phoenix, but excluding Las Vegas). For this scheme, the construction of new transmission lines and substations is estimated to disturb a land area on the order of 2,873 acres (11.6 km$^2$).

Table 11.3.23.2-3 shows the estimated NPV of both transmission schemes and takes into account the cost of constructing the lines, the substations, and the projected revenue stream over

**TABLE 11.3.23.2-3 Comparison of Potential Transmission Lines with Respect to NPV (Base Case) for the Proposed Dry Lake SEZ**

| Transmission Scheme | City/Load Area Name | Present Value Transmission Line Cost ($ million) | Present Value Substation Cost ($ million) | Annual Sales Revenue ($ million) | Present Worth of Revenue Stream ($ million) | NPV ($ million) |
|---|---|---|---|---|---|---|
| 1 | Las Vegas, Nevada[a] | 67.1 | 60.4 | 160.3 | 1,237.9 | 1,110.4 |
| 2 | Los Angeles, California[a]<br>Phoenix, Arizona[b] | 1,311.3 | 60.4 | 160.3 | 1,237.9 | –133.0 |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

the 10-year horizon. A positive NPV indicates that revenues more than offset investments. This calculation does not include the cost of producing electricity.

The most economically attractive configuration (transmission scheme 1) has the highest positive NPV and has Las Vegas. The secondary case (transmission scheme 2), which excludes the Las Vegas market, is less economically attractive. For the assumed utilization factor of 20%, scheme 2 exhibits a negative NPV, implying that this option may not be economically viable under the current assumptions.

Table 11.3.23.2-4 shows the effect of varying the value of the utilization factor on the NPV of the transmission schemes. The table shows that at about 30% utilization, NPVs for both schemes are positive. It also shows that as the utilization factor is increased, the economic

**TABLE 11.3.23.2-4 Effect of Varying the Utilization Factor on the NPV of the Transmission Schemes for the Proposed Dry Lake SEZ**

| Transmission Scheme | City/Load Area Name | NPV ($ million) at Different Utilization Factors | | | | | |
|---|---|---|---|---|---|---|---|
| | | 20% | 30% | 40% | 50% | 60% | 70% |
| 1 | Las Vegas, Nevada[a] | 1,110 | 1,729 | 2,348 | 2,967 | 3,586 | 4,205 |
| 2 | Los Angeles, California[a]<br>Phoenix, Arizona[b] | –134 | 485 | 1,104 | 1,723 | 2,342 | 2,961 |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

viability of the lines increases. Utilization factors can be raised by allowing the new dedicated lines to market other power generation outputs in the region in addition to that of its associated SEZ.

The findings of the DLT analysis for the proposed Dry Lake SEZ are as follows:

- Transmission scheme 1, which identifies Las Vegas as the primary market, represents the most favorable option based on NPV and land use requirements. This configuration would result in new land disturbance of about 669 acres (2.7 km$^2$).

- Transmission scheme 2, which represents an alternative configuration if Las Vegas is excluded, serves Los Angeles and Phoenix. This configuration would result in new land disturbance of about 2,873 acres (11.6 km$^2$).

- Other load area configurations are possible but would be less favorable than scheme 1 in terms of NPV and, in most cases, also in terms of land use requirements. If new electricity generation at the proposed Dry Lake SEZ is not sent to either of the two markets identified above, the potential upper-bound impacts in terms of cost would be greater.

- The analysis of transmission requirements for the proposed Dry Lake SEZ indicates no reduction of impacts from increasing the solar-eligible load assumption for transmission scheme 1, which brings power to Las Vegas. Increasing the solar-eligible percentage would have no effect, because an adequate load area was identified under the 20% assumption that would accommodate all of the SEZ's capacity. Thus, line distances and voltages would not be affected by increasing the solar-eligible load assumption, and similarly the associated costs and land disturbance would not be affected. However, for transmission scheme 2, which serves Los Angeles and Phoenix, increasing the solar-eligible load assumption could result in lower cost and land disturbance estimates, because it is possible that fewer load areas would be needed to accommodate the SEZ's capacity.

### 11.3.24 Impacts of the Withdrawal

The BLM is proposing to withdraw 6,186 acres (25 km$^2$) of public land comprising the proposed Dry Lake SEZ from settlement, sale, location, or entry under the general land laws, including the mining laws, for a period of 20 years (see Section 2.2.2.2.4 of the Final Solar PEIS). The public lands would be withdrawn, subject to valid existing rights, from settlement, sale, location, or entry under the general land laws, including the mining laws. This means that the lands could not be appropriated, sold, or exchanged during the term of the withdrawal and new mining claims could not be filed on the withdrawn lands. Mining claims filed prior to the segregation or withdrawal of the identified lands would take precedence over future solar energy development. The withdrawn lands would remain open to the mineral leasing, geothermal leasing, and mineral material laws, and the BLM could elect to lease the oil, gas, coal, or geothermal steam resources or to sell common-variety mineral materials, such as sand and gravel, contained in the withdrawn lands. In addition, the BLM would retain the discretion to authorize linear and renewable energy ROWs on the withdrawn lands.

The purpose of the proposed land withdrawal is to minimize the potential for conflicts between mineral development and solar energy development for the proposed 20-year withdrawal period. Under the land withdrawal, only mining claims recorded before the current segregation could be developed, if valid. Because the Dry Lake SEZ has 23 active claims, it is possible that some mining-related surface development could occur at the site during the withdrawal period and preclude use of at least a portion of the SEZ for solar energy development. Mining-related surface development includes activities such as the establishment of open pit mining, construction of roads for hauling materials, extraction of ores from tunnels or adits, or construction of facilities to process the material mined.

For the Dry Lake SEZ, impacts of the proposed withdrawal on mineral resources and related economic activity and employment are expected to be negligible to minor. Although the area contains a number of active lode and placer claims (and several closed lode and placer claims), there has been no known production from the lands within the SEZ (BLM 2012a). Since the claims were filed prior to the temporary segregation, they would take precedence over future solar energy development if found to be valid. The lands within the SEZ would remain open to mineral leasing, geothermal leasing, and mineral materials laws. Therefore, the BLM could still elect to lease oil, gas, coal, or geothermal resources or to sell common-variety mineral materials, such as sand and gravel, at its discretion. The lands would also remain open to ROW authorizations.

Although the mineral potential of the lands within the Dry Lake SEZ is low, the proposed withdrawal of lands within the SEZ would preclude many types of mining activity over a 20-year period, resulting in the avoidance of potential mining-related adverse impacts. Impacts commonly related to mining development include increased soil erosion and sedimentation, water use, generation of contaminated water in need of treatment, creation of lagoons and ponds (hazardous to wildlife), toxic runoff, air pollution, establishment of noxious weeds and invasive species, habitat destruction or fragmentation, disturbance of wildlife, blockage of migration corridors, increased visual contrast, noise, destruction of cultural artifacts and fossils and/or their context, disruption of landscapes and sacred places of interest to tribes, increased traffic and related emissions, and conflicts with other land uses (e.g., recreational).

## 11.3.25 References

*Note to Reader:* This list of references identifies Web pages and associated URLs where reference data were obtained for the analyses presented in this Final Solar PEIS. It is likely that at the time of publication of this Final Solar PEIS, some of these Web pages may no longer be available or their URL addresses may have changed. The original information has been retained and is available through the Public Information Docket for this Final Solar PEIS.


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## 11.3.26 Errata for the Proposed Dry Lake SEZ

This section presents corrections to material presented in the Draft Solar PEIS and the Supplement to the Draft. The need for these corrections was identified in several ways: through comments received on the Draft Solar PEIS and the Supplement to the Draft (and verified by the authors), through new information obtained by the authors subsequent to publication of the Draft Solar PEIS and the Supplement to the Draft, or through additional review of the original material by the authors. Table 11.3.26-1 provides corrections to information presented in the Draft Solar PEIS and the Supplement to the Draft.

**TABLE 11.3.26-1 Errata for the Proposed Dry Lake SEZ (Section 11.3 of the Draft Solar PEIS and Section C.4.2 of the Supplement to the Draft Solar PEIS)**

| Section No. | Page No. | Line No. | Figure No. | Table No. | Correction |
|---|---|---|---|---|---|
| 11.3.7.1.2 | 11.3-45 | | 11.3.7.1-5 | | The soil map presented in the Draft Solar PEIS for the Dry Lake SEZ erroneously showed the Dry Lake Valley North SEZ; the correct soil map can be found in Section 11.3.7.1.2 of this Final Solar PEIS as Figure 11.3.7.1-1. |
| 11.3.9.1.3 | 11.3-57 | 13–15 | | | “The Southern Nevada Water Authority (SNWA 2009) stated that the Las Vegas Valley Water District has leased the majority of their 2,200 ac-ft/yr (2.7 million $m^3$/yr) of groundwater rights in Garnet Valley to dry-cooled power plants in the area,” should read, “The Southern Nevada Water Authority (SNWA 2009) stated that the Las Vegas Valley Water District has leased the majority of their combined 2,200 ac-ft/yr (2.7 million $m^3$/yr) of groundwater rights in Garnet Valley and Hidden Valley to dry-cooled power plants in the area.” |
| 11.3.11.2 | | | | | All uses of the term “neotropical migrants” in the text and tables of this section should be replaced with the term “passerines.” |
| 11.3.22.2.2 | 11.3-344 | 27 | | | “and western Utah” should be removed from the following statement: ***Clark, Lincoln, and White Pine Counties Groundwater Development Project.*** The Southern Nevada Water Authority (SNWA) proposes to construct a groundwater development project that would transport approximately 122,755 ac-ft/yr (151 million $m^3$/yr) of groundwater under existing water rights and applications from several hydrographic basins in eastern Nevada and western Utah. |

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# 11.4 DRY LAKE VALLEY NORTH

## 11.4.1 Background and Summary of Impacts

### 11.4.1.1 General Information

The proposed Dry Lake Valley North SEZ is located in Lincoln County in southeastern Nevada. The population centers closest to the SEZ are Pioche, located about 15 mi (24 km) to the east, and Caliente, located about 15 mi (24 km) to the southeast; both communities have populations of about 1,000. The smaller communities of Caselton and Prince are located about 13 mi (21 km) to the east of the SEZ. The major roads nearest to the Dry Lake Valley North SEZ are State Route 318, which is about 7 mi (11 km) to the west of the SEZ, and U.S. 93, about 8 mi (13 km) to the south. Access to the interior of the SEZ is by dirt roads. The nearest railroad access is approximately 25 mi (40 km) from the SEZ. As of October 28, 2011, there were no pending solar applications within or adjacent to the SEZ.

As published in the Draft Solar PEIS (BLM and DOE 2010), the proposed Dry Lake Valley North SEZ had a total area of 76,874 acres (311 km$^2$). In the Supplement to the Draft (BLM and DOE 2011), the size of the SEZ was reduced (see Figure 11.4.1.1-1), eliminating 48,148 acres (195 km$^2$), mainly the northern portion of the SEZ. Removing the northern portion of the SEZ will avoid or minimize some potential impacts from development in the SEZ, including impacts on sage-grouse and other wildlife, impacts on grazing, and impacts on military operations. In addition, about 3,657 acres (15 km$^2$) of wetland and dry lake within the remaining SEZ boundaries were identified as non-development areas (Figure 11.4.1.1-2). The remaining developable area within the SEZ is 25,069 acres (101.5 km$^2$).

The lands eliminated from the proposed Dry Lake Valley North SEZ will be retained as solar ROW variance areas, because the BLM expects that individual projects could be sited in these areas to avoid and/or minimize impacts. Any solar development within these areas in the future would require appropriate environmental analysis.

The analyses in the following sections update the affected environment and potential environmental, cultural, and socioeconomic impacts associated with utility-scale solar energy development in the proposed Dry Lake Valley North SEZ as described in the Draft Solar PEIS.

### 11.4.1.2 Development Assumptions for the Impact Analysis

Maximum solar development of the proposed Dry Lake Valley North SEZ was assumed to be 80% of the developable SEZ area over a period of 20 years, a maximum of 20,055 acres (81 km$^2$). Full development of the Dry Lake Valley North SEZ would allow development of facilities with an estimated total of between 2,228 MW (power tower, dish engine, or PV technologies, 9 acres/MW [0.04 km$^2$/MW]) and 4,011 MW (solar trough technologies, 5 acres/MW [0.02 km$^2$/MW]) of electrical power capacity.

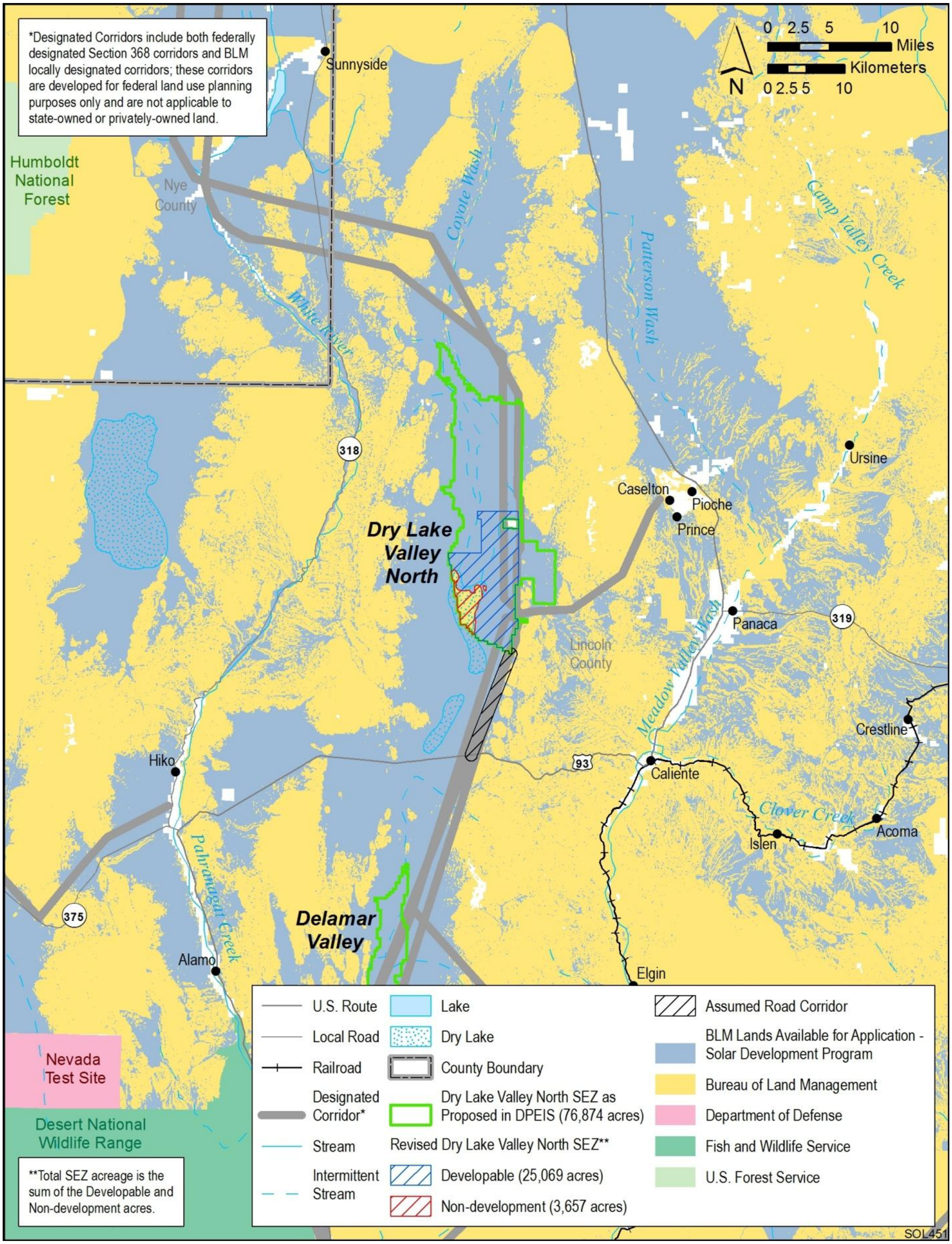


**FIGURE 11.4.1.1-1 Proposed Dry Lake Valley North SEZ as Revised**

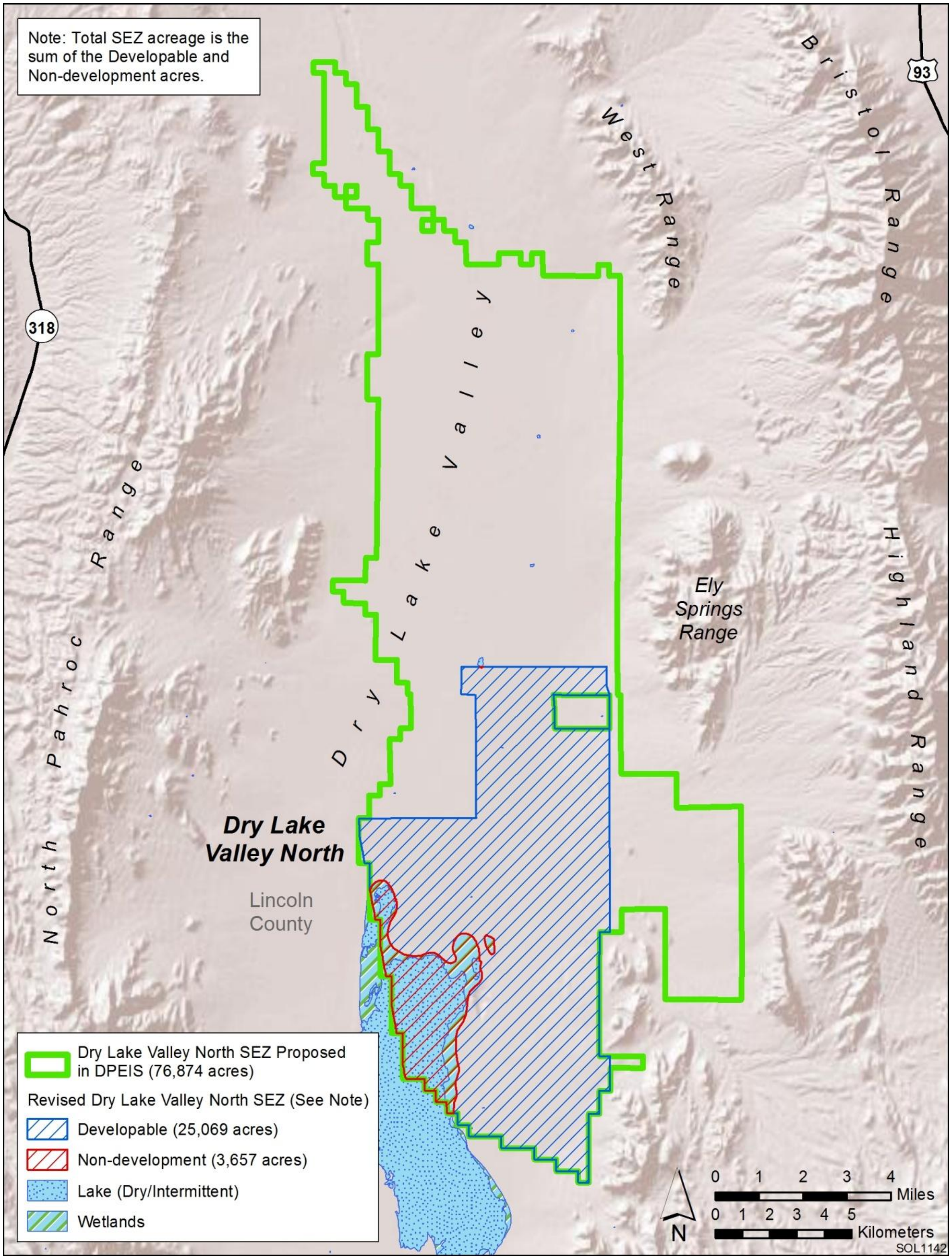


**FIGURE 11.4.1.1-2 Developable and Non-development Areas for the Proposed Dry Lake Valley North SEZ as Revised**

Availability of transmission from SEZs to load centers will be an important consideration for future development in SEZs. For the proposed Dry Lake Valley North SEZ, the nearest existing transmission line as identified in the Draft Solar PEIS is a 69-kV transmission line that runs through the SEZ. It is possible that this existing line could be used to provide access from the SEZ to the transmission grid, but the 69-kV capacity of the existing line would not be adequate for 2,228 to 4,011 MW of new capacity. Therefore, at full build-out capacity, new transmission lines and possibly upgrades of existing transmission lines would be required to bring electricity from the proposed Dry Lake Valley North SEZ to load centers. An assessment of the most likely load center destinations for power generated at the Dry Lake Valley North SEZ and a general assessment of the impacts of constructing and operating new transmission facilities to those load centers are provided in Section 11.4.23. In addition, the generic impacts of transmission and associated infrastructure construction and of line upgrades for various resources are discussed in Chapter 5 of this Final Solar PEIS. Project-specific analyses would also be required to identify the specific impacts of new transmission construction and line upgrades for any projects proposed within the SEZ.

The Dry Lake Valley North SEZ partially overlaps a Section 368 federally designated energy corridor. In addition, it overlaps a locally designated transmission corridor. For this impact assessment, it was assumed that up to 80% of the proposed SEZ could be developed. This assumption does not take into account the potential limitations to solar development that may result from siting constraints associated with these corridors. The development of solar facilities and existing corridors will be dealt with by the BLM on a case-by-case basis; see Section 11.4.2.2 on impacts on lands and realty for further discussion.

The Draft Solar PEIS had indicated that the nearest major access road was NV 318, located 7 mi (11 km) to the west of the SEZ, and that an access road to the SEZ would be built from NV 318. For this updated assessment, it was assumed that an access road would be built to U.S. 93, 8 mi (13 km) to the south of the SEZ, because the new access road to the south could utilize the corridor of an existing county road and would not pass over areas with steep terrain. It was assumed that construction of the access road would result in 58 acres (0.2 km$^2$) of land disturbance, as summarized in Table 11.4.1.2-1. While there are dirt/ranch roads within the SEZ, additional internal road construction would also likely be required to support solar facility construction.

#### 11.4.1.3 Programmatic and SEZ-Specific Design Features

The proposed programmatic design features for each resource area to be required under BLM's Solar Energy Program are presented in Section A.2.2 of Appendix A of this Final Solar PEIS. These programmatic design features are intended to avoid, minimize, and/or mitigate adverse impacts of solar energy development and will be required for development on all BLM-administered lands, including SEZ and non-SEZ lands.

The discussions below addressing potential impacts of solar energy development on specific resource areas (Sections 11.4.2 through 11.4.22) also provide an assessment of the effectiveness of the programmatic design features in mitigating adverse impacts from solar

**TABLE 11.4.1.2-1 Assumed Development Acreages, Solar MW Output, and Nearest Major Access Road and Transmission Line for the Proposed Dry Lake Valley North SEZ as Revised**

| Total Developable Acreage and Assumed Developed Acreage (80% of Total) | Assumed Maximum SEZ Output for Various Solar Technologies | Distance to Nearest State, U.S., or Interstate Highway | Distance and Capacity of Nearest Existing Transmission Line | Area of Assumed Road ROW | Distance to Nearest Designated Transmission Corridor[e] |
|---|---|---|---|---|---|
| 25,069 acres and 20,055 acres[a] | 2,228 MW[b] and 4,011 MW[c] | U.S. 93 8 mi[d] | 0 mi and 69 kV | 58 acres | 0 mi |

[a] To convert acres to $km^2$, multiply by 0.004047.

[b] Maximum power output if the SEZ were fully developed using power tower, dish engine, or PV technologies, assuming 9 acres/MW (0.04 $km^2$/MW) of land required.

[c] Maximum power output if the SEZ were fully developed using solar trough technologies, assuming 5 acres/MW (0.02 $km^2$/MW) of land required.

[d] This access road ROW has been changed from that presented in the Draft Solar PEIS to assume tie in via an existing, non-mountainous route. To convert mi to km, multiply by 1.609.

[e] BLM-designated corridors are developed for federal land use planning purposes only and are not applicable to state-owned or privately owned land.

development within the SEZ. SEZ-specific design features to address impacts specific to the proposed Dry Lake Valley North SEZ may be required in addition to the programmatic design features. The proposed SEZ-specific design features for the Dry Lake Valley North SEZ have been updated on the basis of revisions to the SEZ since the Draft Solar PEIS (such as boundary changes and the identification of non-development areas) and on the basis of comments received on the Draft and Supplement. All applicable SEZ-specific design features identified to date (including those from the Draft Solar PEIS that are still applicable) are presented in Sections 11.4.2 through 11.4.22.

## 11.4.2 Lands and Realty

### 11.4.2.1 Affected Environment

The boundary revision of the proposed SEZ has reduced the total area of the proposed SEZ by 48,148 acres (195 $km^2$) to 28,726 acres (116 $km^2$). This revised area is the southern portion of the original SEZ. Although the area is reduced in size, the general description of the southern portion of the area presented in the Draft Solar PEIS is still accurate; the playa lake has now been identified as a non-development area. The parcel of private land mentioned in the

Draft Solar PEIS is surrounded on three sides by the SEZ. Numerous roads and trails enter and/or cross through the proposed SEZ.

The proposed Dry Lake Valley North SEZ partially overlaps one Section 368 federally designated energy corridor and one locally designated transmission corridor. Both of these corridors were designated in the Ely Resource Management Plan (RMP) in 2008 (BLM 2008). The western locally designated corridor is 2,640 ft (804 m) wide and was designated at the direction of Congress in the Lincoln County Conservation, Recreation, and Development Act (LCCRDA) of 2004 to accommodate a water pipeline, transmission line, and related facilities proposed by the SNWA. The eastern corridor is part of the Southwest Intertie Project and was designated as a Section 368 Corridor in 2009.[1] These existing corridors will be used primarily for the siting of transmission lines and other infrastructure such as pipelines. These existing corridors will be the preferred locations for any transmission development that is required to support solar development and future transmission grid improvements related to the build-out of the Dry Lake Valley North SEZ. Any use of the corridor lands within the Dry Lake Valley North SEZ for solar energy facilities, such as solar panels or heliostats, must be compatible with the future use of the existing corridors. The BLM will assess solar projects in the vicinity of existing corridors on a case-by-case basis. The BLM will review and approve individual project plans of development to ensure compatible development that maintains the use of the corridor.

#### 11.4.2.2 Impacts

There is a large change in the potential land use impacts as a result of the reduction in the amount of area that might be occupied by solar facilities. The maximum developable area for solar development within the originally proposed SEZ was 61,499 acres (102 km$^2$); for the revised SEZ the maximum developable area is 20,055 acres (81 km$^2$). This change results in a smaller area of intense industrial type development, but the solar development would still introduce a new and discordant land use into this isolated and undeveloped area.

Solar facilities cannot be constructed within the ROWs of existing transmission lines or pipelines because of incompatibility issues such as construction and operational safety, conductor to ground clearances, and the need to maintain access for construction and maintenance of transmission line or pipeline structures. Utility corridors and the Section 368 corridors are much wider than the typical transmission line ROWs (e.g., 200 ft [61 m] for a 500-kV line); thus some use of the corridors for solar facilities might be possible as long as the actual ROW of transmission lines or pipelines was not used. However, such use of the corridors would limit their use for additional transmission in the future. The LCCRDA is congressionally authorized, and because of this, the area of the SEZ within the western ROW corridor (approximately 3,600 acres [14.5 km$^2$]) would likely not be available for solar development. It is also not considered likely that this corridor could be moved

[1] Section 368 of the Energy Policy Act of 2005 (P.L. 109-58) required federal agencies to engage in transmission corridor planning (see Section 1.6.2.1 of the Draft Solar PEIS). As a result of this mandate, the BLM, DOE, USFS, and DoD prepared a PEIS to evaluate the designation of energy corridors on federal lands in 11 western states, including the 6 states evaluated in this study (DOE and DOI 2008). The BLM and USFS issued RODs to amend their respective land use plans to designate numerous corridors, often referred to as Section 368 corridors.

outside of the SEZ in order to eliminate or minimize the impact on future solar development. Conversely, the capacity for future electrical transmission lines or pipelines within the eastern ROW corridor would be restricted by solar energy development within that corridor. The situation with the eastern corridor is an administrative conflict that can be addressed by the BLM through its planning process, but there would be implications either for the amount of potential solar energy development that could be accommodated within the SEZ or for the amount of additional corridor capacity available for future development. These issues would be addressed at the project-specific level and could result in the need for amendment of the BLM's land use plan for the area.

It is now assumed that road access to the SEZ would be to U.S. 93. Although an additional 58 acres (0.2 $km^2$) of land disturbance was assumed for construction of the access road, it is likely that part of the road would follow the route of an existing county road, thereby minimizing land disturbance.

The existing roads that cross or enter the proposed revised SEZ could be closed or relocated if solar development occurs. If any of these roads are County roads, the County would need to be consulted and would have to agree on their disposition. The County would also have to be consulted on any improvement in the access road from U.S. 93 and on future maintenance requirements.

#### 11.4.2.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on lands and realty are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some mitigation for the identified impacts but will not mitigate all adverse impacts. For example, impacts related to the exclusion of many existing and potential uses of the public land, the visual impact of an industrial-type solar facility within an otherwise rural area, and induced land use changes, if any, on nearby or adjacent state and private lands may not be fully mitigated.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature for near the revised Dry Lake Valley North SEZ has been identified:

- Priority consideration should be given to utilizing existing County roads to provide construction and operations access to the SEZ. Any potential impacts on existing County roads would be discussed with the County.

The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.4.3 Specially Designated Areas and Lands with Wilderness Characteristics

#### 11.4.3.1 Affected Environment

The discussion of specially designated areas in the Draft Solar PEIS remains valid with the exception that after the revision of the proposed boundaries of the SEZ, the closest that any portion of the Silver State OHV Trail is to the SEZ is about 3 mi (5 km), and most of the boundary of the SEZ is now greater than 5 mi (8 km) from the trail.

#### 11.4.3.2 Impacts

A small adverse impact on wilderness characteristics in the Weepah Spring and Big Rocks WAs is still anticipated. The Silver State OHV Trail is located on the east, south, and west sides of the SEZ, but with the change in SEZ boundaries, it is now anticipated that there would be no impact on trail users.

Other impacts on specially designated areas described in the Draft Solar PEIS remain accurate.

Improvement of 8 mi (13 km) of the current access road to the proposed SEZ from U.S. 93 would not likely result in additional adverse impacts on surrounding specially designated areas.

#### 11.4.3.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on specially designated areas are described in Section A.2.2 of Appendix A of this Final Solar PEIS (design features for both specially designated areas and visual resources would address impacts). Implementing the programmatic design features will provide some mitigation for the identified impacts but would not mitigate all adverse impacts.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for specially designated areas and lands with wilderness characteristics have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.4.4 Rangeland Resources

#### 11.4.4.1 Livestock Grazing

##### *11.4.4.1.1 Affected Environment*

The revision to the boundary of the proposed SEZ removes the Wilson Creek and Simpson grazing allotments from the SEZ. The only allotment still within the proposed SEZ boundary is the Ely Springs Cattle allotment. The grazing permittee has indicated interest in solar development on his private land located near the northeastern corner of the SEZ, and that he would support development in the allotment.

##### *11.4.4.1.2 Impacts*

The anticipated impacts on the Ely Springs Cattle allotment of a potential loss of 2,761 AUMs (65%) from that allotment remain the same as identified in the Draft Solar PEIS. The Wilson Creek and Simpson allotments would no longer be directly affected.

Economic impacts of the loss of grazing capacity must be determined at the allotment-specific level. For most public land grazing operations, any loss of grazing capacity is an economic concern, but it is not possible to assess the extent of that specific impact at this programmatic level. For that reason, only a general assessment is made based on the projected loss of livestock AUMs. This assessment does not consider potential impacts on management costs, the impacts of reducing the scale of an operation, or the impact on the grazing value of the ranch, including the value related to the private land or other associated assets. Based on law and regulation, this loss of value for permittees would not be mitigated directly by the BLM; rather, developers of solar projects within the SEZ would be encouraged to mitigate such losses.

##### *11.4.4.1.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on livestock grazing are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some mitigation for identified impacts but will not mitigate a complete loss of the grazing permit, the loss of livestock AUMs, or the loss of value in ranching operations, including private land values.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature for livestock has been identified:

- Within the Ely Springs cattle allotment, solar development should be sited to minimize the number of pastures affected, and existing range improvements should be relocated in coordination with the grazing permittee.

The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.4.4.2 Wild Horses and Burros

#### *11.4.4.2.1 Affected Environment*

As presented in the Draft Solar PEIS, 5.4% of the Silver King HMA occurred within the original boundaries of the Dry Lake Valley North SEZ (Figure 11.4.4.2-1 of the Draft Solar PEIS). However, the revised area of the SEZ now avoids all but 0.02% of the Silver King HMA (Figure 11.4.4.2-1).

#### *11.4.4.2.2 Impacts*

As presented in the Draft Solar PEIS, solar energy development within the proposed Dry Lake Valley North SEZ could have directly affected about 32,440 acres (131.3 km$^2$), more than 5% of the Silver King HMA (BLM 2010a). This was considered a moderate impact on the wild horse population within the HMA. Solar energy development within the revised area of the Dry Lake Valley North SEZ would directly affect only 140 acres (0.6 km$^2$) of this HMA, which is considered a small potential impact. Also, the change in assumed access road assumption (to connect to U.S. 93) means that the access road would not cross through the Silver King HMA.

#### *11.4.4.2.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on wild horses and burros are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some mitigation for the identified impacts.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature to address impacts on wild horses and burros has been identified:

- Installation of fencing and access control, provision for movement corridors, delineation of open range, traffic management (e.g., vehicle speeds), compensatory habitat restoration, and access to or development of water sources should be coordinated with the BLM.

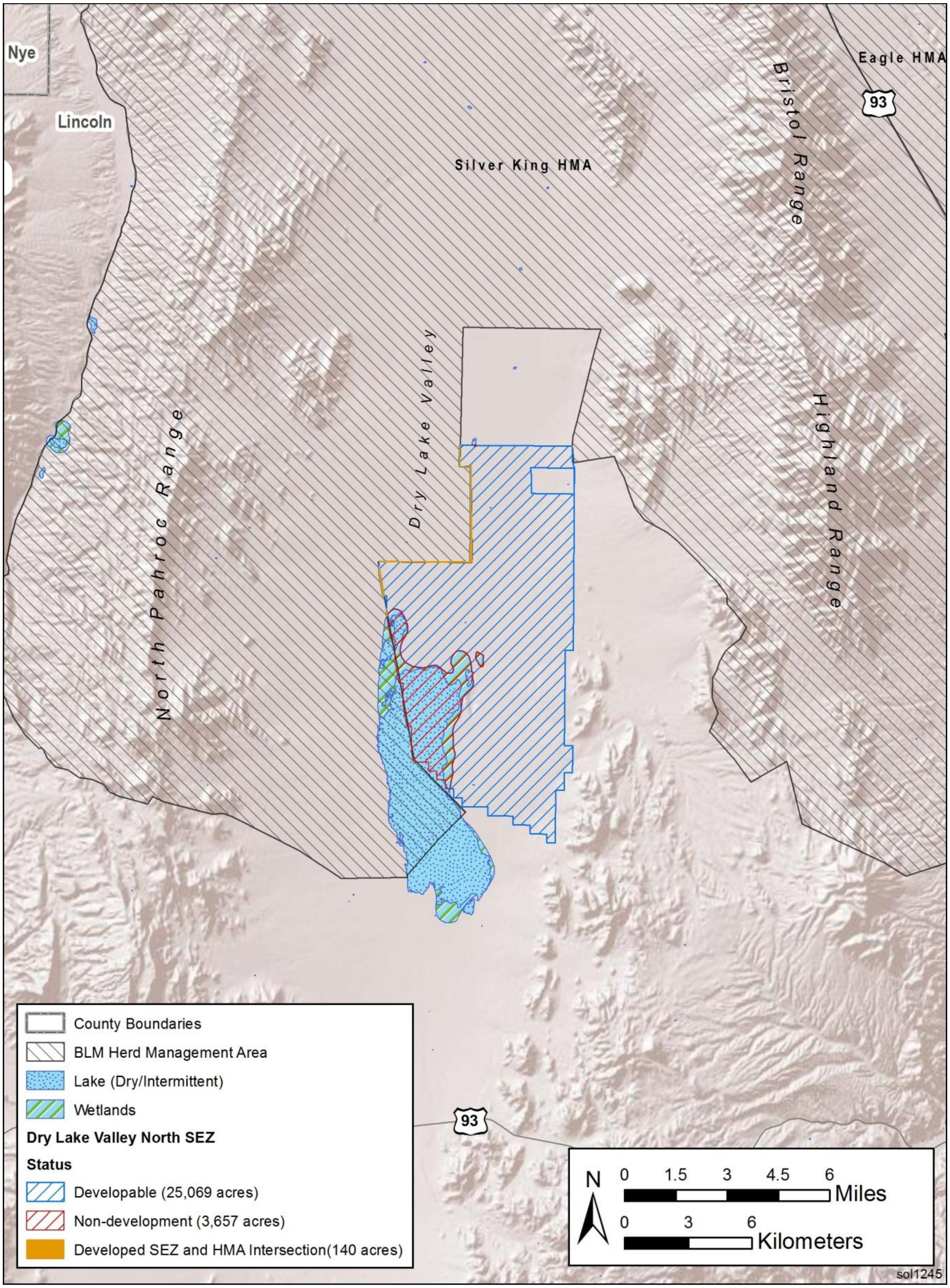


**FIGURE 11.4.4.2-1 Silver King Wild Horse and Burro Herd Management Area near the Proposed Dry Lake Valley North SEZ as Revised (Source: BLM 2010a)**

With the implementation of required programmatic and SEZ-specific design features, impacts on wild horses would be small. The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.4.5 Recreation

### 11.4.5.1 Affected Environment

The boundary of the proposed SEZ has been reduced by 48,148 acres (195 $km^2$), and the SEZ has been reduced in length from about 25 mi (40 km) to about 11 mi (17.7 km).

### 11.4.5.2 Impacts

Recreational use of lands developed for solar energy production, including OHV use of designated roads and trails, would be precluded. The types of impacts described in the Draft Solar PEIS are still accurate but would take place on substantially fewer acres, leading to a reduction in the potential level of impact on recreational users.

In addition, lands that are outside the proposed SEZ may be acquired or managed for mitigation of impacts on other resources (e.g., sensitive species). Managing these lands for mitigation could further exclude or restrict recreational use, potentially leading to additional losses in recreational opportunities in the region. The impact of acquisition and management of mitigation lands would be considered as a part of the environmental analysis of specific solar energy projects.

Improvement of 8 mi (13 km) of the existing access road to the proposed SEZ from U.S. 93 would benefit recreational users of the area.

### 11.4.5.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on recreation are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some mitigation for the identified impacts

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature for recreation has been identified:

- Because of the 11 mi (18 km) length of the SEZ and the potential for solar development to sever current east–west travel routes, legal vehicular access through the area should be maintained.

The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.4.6 Military and Civilian Aviation

### 11.4.6.1 Affected Environment

Although the size of the proposed Dry Lake Valley North SEZ has been substantially reduced, the discussion of military uses of the SEZ in the Draft Solar PEIS remains valid. Portions of the proposed Dry Valley Lake North SEZ are covered by two MTRs with 200-ft (61-m) AGL operating limits and a major special use airspace (SUA). The area is completely included within the airspace use boundary of the NTTR. Supersonic speeds are authorized at and above 5,000 AGL (1,524 m) in the NTTR in this area.

### 11.4.6.2 Impacts

Impacts described in the Draft Solar PEIS remain valid and have been updated with additional input from the DoD. Impacts include the following:

- Light from solar energy facilities could affect DoD nighttime operations.

Through comments on the Draft Solar PEIS and the Supplement to the Draft, the DoD expressed concern for solar energy facilities that might affect military test and training operations. The DoD requested that the proposed Dry Lake Valley North area be removed from consideration as an SEZ and that the entire area (original and remaining SEZ) be identified as an exclusion area. If the area is not eliminated from consideration, the DoD requests that the technology at the site be restricted to low-profile, low-glare PV technologies under 50 ft AGL (15 m), similar to the PV I array at Nellis Air Force Base.

### 11.4.6.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on military and civilian aviation are described in Section A.2.2 of Appendix A of this Final Solar PEIS. The programmatic design features require early coordination with the DoD to identify and avoid, minimize, and/or mitigate, if possible, potential impacts on the use of military airspace and military testing activities.

No SEZ-specific design features to protect either military airspace or civilian aviation operations have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.4.7 Geologic Setting and Soil Resources

### 11.4.7.1 Affected Environment

#### *11.4.7.1.1 Geologic Setting*

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- The terrain of the proposed Dry Lake Valley North SEZ slopes gently to the west and southwest (Figure 11.4.7.1-1). The boundaries of the proposed SEZ have been changed to exclude mainly the northern portion of the SEZ. Within this revised area, about 3,657 acres (15 km$^2$) of wetland and dry lake have been identified as non-development areas. On the basis of these changes, the elevations range from about 4,800 ft (1,463 m) at its northeast corner to about 4,498 ft (1,370 m) near the SEZ's southwest corner at Dry Lake.

#### *11.4.7.1.2 Soil Resources*

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- Soils within the proposed Dry Lake Valley North SEZ as revised are predominantly a mix of sandy loams, silt loams, loamy sands, and loams; the Saltydog–Ambush–Panacker and Koyen–Geer associations now make up about 46% of the soil coverage at the site (Table 11.4.7.1-1).

- Soil unit coverage at the proposed Dry Lake Valley North SEZ as revised is shown in Figure 11.4.7.1-2. Taken together, the new SEZ boundaries and non-development areas eliminate 2,415 acres (9.8 km2) of the Saltydog–Ambush–Panacker association, 4,339 acres (18 km$^2$) of the Koyen–Geer association, 908 acres (3.7 km$^2$) of the Tybo–Leo association, 2,755 acres (11 km$^2$) of the Ewelac–Playas association, 1,210 acres (4.9 km$^2$) of the Cliffdown–Geer association, 3,640 acres (14.7 km$^2$) of the Ambush–Penoyer association, 856 acres (3.5 km$^2$) of the Geer–Penoyer association, 2,488 acres (10 km$^2$) of the Saltydog–Geer association, 1,599 acres (6.5 km$^2$) of the Ambush–Panacker–Playas association, 1,075 acres (4.4 km$^2$) of the Ursine association, 6,999 acres (28 km$^2$) of the Koyen–Slaw–Penoyer association, 6,366 acres (26 km$^2$) of the Koyen–Slaw–Penoyer association, 8,793 acres (36 km$^2$) (all) of the Koyen–Penoyer association, 4,634 acres (19 km$^2$) (all) of the Watoopah gravelly loamy sand, 2,267 acres (9.2 km$^2$) (all) of the Penoyer–Geer association, 797 acres (3.2 km$^2$) (all) of the Ursine-moderately sloping-Mezzer-Ursine association, and 327 acres (1.3 km$^2$) (all) of the Leo-Delamar association.

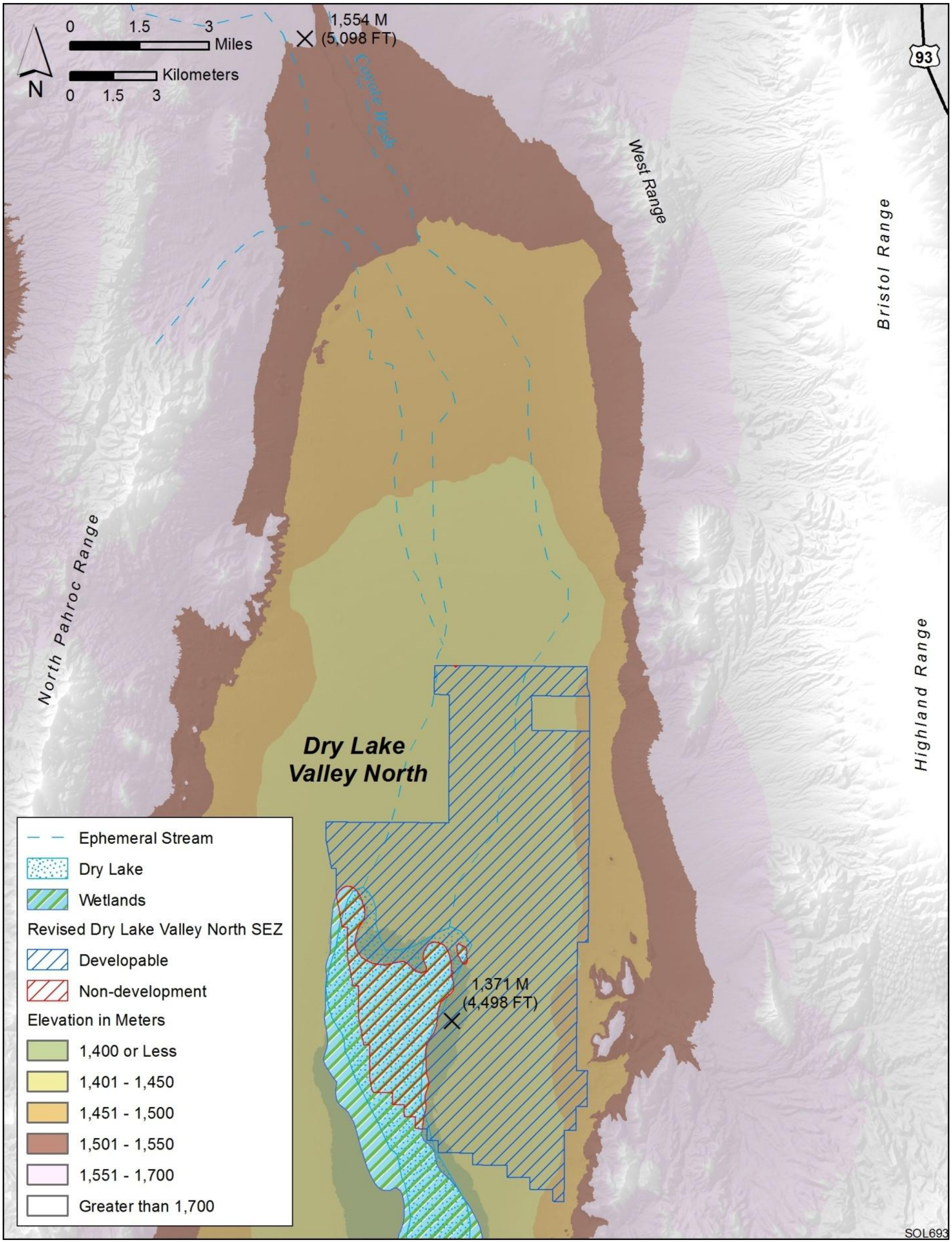


**FIGURE 11.4.7.1-1 General Terrain of the Proposed Dry Lake Valley North SEZ as Revised**

1 **TABLE 11.4.7.1-1 Summary of Soil Map Units within the Proposed Dry Lake Valley North SEZ as Revised**

| Map Unit Symbol | Map Unit Name | Erosion Potential | | Description | Area in Acres[c] (Percentage of SEZ) |
|---|---|---|---|---|---|
| | | Water[a] | Wind[b] | | |
| 3192 | Saltydog–Ambush–Panacker association | Moderate | Moderate (WEG 3)[d] | Consists of 40% Saltydog loam, 30% Ambush fine sandy loam, and 20% Panacker fine sandy loam. Level to nearly level soils on alluvial flats. Parent material is alluvium and lacustrine deposits from limestone and welded tuff (Saltydog) and eolian deposits over lacustrine deposits. Very deep and well drained, with moderate surface runoff potential and moderate to moderately rapid permeability. Available water capacity is moderate to high. Moderate rutting hazard. Used mainly for livestock grazing and wildlife habitat. Prime farmland[e] if irrigated and reclaimed of excess salts and sodium. | 7,212 (27.3)[f] |
| 1076 | Koyen–Geer association | Slight | Moderate (WEG 4) | Consists of about 60% Koyen loamy sand and 30% Geer sandy loam. Level to nearly level soils on alluvial fan skirts, alluvial flats, and drainageways. Parent material is alluvium from volcanic rocks with a high component of loess (Koyen) and welded tuff and limestone with a minor component of volcanic ash (Geer). Very deep and well drained, with moderate surface runoff potential and moderate to moderately rapid permeability. Available water capacity is moderate. Moderate rutting hazard. Used mainly for livestock grazing, wildlife habitat, and cultivated crops of alfalfa and small grains (Geer). Prime farmland if irrigated and reclaimed of excess salts and sodium. | 6,057 (21.1)[g] |
| 1473 | Tybo–Leo association | Moderate | Moderate (WEG 4) | Consists of 60% Tybo gravelly coarse sandy loam and 25% Leo very gravelly sandy loam. Nearly level soils on inset fans and fan remnants. Parent material is alluvium from mixed sources, including volcanic rocks. Shallow to a duripan (Tybo) to very deep and well to excessively drained, with high surface runoff potential (very slow infiltration rate) and moderately rapid to rapid permeability. Available water capacity is very low to low. Moderate rutting hazard. Used mainly for livestock grazing, wildlife habitat, and irrigated cropland. | 3,107 (10.8) |

2

**TABLE 11.4.7.1-1 (Cont.)**

| Map Unit Symbol | Map Unit Name | Erosion Potential: Water[a] | Erosion Potential: Wind[b] | Description | Area in Acres[c] (Percentage of SEZ) |
|---|---|---|---|---|---|
| 3193 | Ewelac–Playas association | Moderate | Moderate (WEG 4) | Consists of 50% Ewelac silt loam and 40% Playas (silty clay loam). Level to nearly level soils on basin floors and alluvial flats. Parent material is lacustrine deposits from mixed sources. Very deep and somewhat poorly (playas) to moderately well drained, with high surface runoff potential (very slow infiltration) and moderately rapid permeability. Available water capacity is very low (playas) to high. Severe rutting hazard. Used mainly for livestock grazing and wildlife habitat. | 2,766 (9.6)[h] |
| 1022 | Cliffdown–Geer association | Slight | Moderate (WEG 5) | Consists of about 60% Cliffdown very gravelly sandy loam and 30% Geer fine sandy loam. Nearly level to gently sloping soils on fan remnants and fan skirts. Parent material is alluvium from welded tuff and limestone with a minor component of volcanic ash. Very deep and well to somewhat excessively drained, with moderate surface runoff potential and moderately rapid permeability. Available water capacity is low to moderate. Slight rutting hazard. Used mainly for grazing and wildlife habitat. | 2,545 (8.9) |
| 3198 | Ambush–Penoyer association | Moderate | Moderate (WEG 3) | Consists of 50% Ambush fine sandy loam and 40% Penoyer very fine sandy loam. Level to nearly level soils on alluvial flats. Parent material is eolian deposits over lacustrine deposits. Very deep and well drained, with moderate surface runoff potential and moderate to moderately rapid permeability. Available water capacity is moderate to high. Moderate rutting hazard. Used mainly for livestock grazing and wildlife habitat. | 1,841 (6.4)[i] |
| 1021 | Geer–Penoyer association | Moderate | Moderate (WEG 3) | Consists of about 65% Geer fine sandy loam and 30% Penoyer silt loam. Level to nearly level soils on alluvial fan skirts and alluvial flats. Parent material is alluvium from welded tuff and limestone with a minor component of volcanic ash. Very deep and well drained, with moderate surface runoff potential and moderate permeability. Available water capacity is high. Severe rutting hazard. Used mainly for livestock grazing and wildlife habitat. | 1,827 (6.4)[j] |

**TABLE 11.4.7.1-1 (Cont.)**

| Map Unit Symbol | Map Unit Name | Erosion Potential: Water[a] | Erosion Potential: Wind[b] | Description | Area in Acres[c] (Percentage of SEZ) |
|---|---|---|---|---|---|
| 3196 | Saltydog–Geer association | Moderate | Moderate (WEG 4L) | Consists of about 60% Saltydog loam and 30% Geer fine sandy loam. Level to nearly level soils on alluvial flats. Parent material is alluvium from welded tuff and limestone with a minor component of volcanic ash. Very deep and well drained, with moderate surface runoff potential and moderate to moderately rapid permeability. Available water capacity is moderate to high. Severe rutting hazard. Used mainly for livestock grazing and wildlife habitat. Prime farmland if irrigated and reclaimed of excess salts and sodium. | 1,503 (5.2)[k] |
| 3194 | Ambush–Panacker–Playas association | Moderate | Moderate (WEG 3) | Consists of about 45% Ambush fine sandy loam, 30% Panacker fine sandy loam, and 15% Playas (silty clay loam). Level to nearly level soils on alluvial flats and basin floors. Parent material is eolian deposits and alluvium from mixed sources over lacustrine deposits. Very deep and somewhat poorly (playas) to well drained, with moderate surface runoff potential and moderate to moderately rapid permeability. Available water capacity is very low (playas) to high. Moderate rutting hazard. Used mainly for livestock grazing and wildlife habitat. Prime farmland if irrigated and reclaimed of excess salts and sodium. | 974 (3.4)[l] |
| 1034 | Ursine association | Moderate | Moderate (WEG 6) | Moderately sloping, very gravelly loam on fan remnants. Parent material is alluvium from mixed sources. Shallow to a duripan and well drained, with high surface runoff potential (very slow infiltration rate) and moderately rapid permeability. Available water capacity is very low. Moderate rutting hazard. Used mainly for livestock grazing and wildlife habitat. | 196 (<1) |

**TABLE 11.4.7.1-1 (Cont.)**

| Map Unit Symbol | Map Unit Name | Erosion Potential: Water[a] | Erosion Potential: Wind[b] | Description | Area in Acres[c] (Percentage of SEZ) |
|---|---|---|---|---|---|
| 1074 | Koyan–Slaw–Penoyer association | Low | High (WEG 1) | Consists of 55% Kenoyan loamy fine sand, 20% Slaw silt loam, and 15% Penoyer very fine sandy loam. Level to nearly level soils on basin floors, basin floor remnants, and fan skirts. Parent material is alluvium from volcanic rocks with a high loess component. Very deep and well drained, with moderate surface runoff potential and slow (Slaw) to moderately rapid permeability. Available water capacity is moderate to high. Moderate rutting hazard. Used mainly for livestock grazing, wildlife habitat, and limited irrigated cropland. | 17 (<1) |
| 1030 | Ursine–Escalante association | Moderate | Moderate (WEG 5) | Consists of 55% Ursine gravelly loam and 30% Escalante fine sandy loam. Nearly level to gently sloping soils formed on inset fans, fan remnants, and drainageways. Parent material is alluvium from rhyolite and some limestone. Shallow to a duripan (Ursine) to very deep and well drained, with high surface runoff potential (very slow infiltration rate) and moderate to moderately rapid permeability. Moderately to strongly saline. Available water capacity is very low to low. Moderate rutting hazard. Used mainly for livestock grazing, wildlife habitat, and limited irrigated cropland. | 4 (<1) |

[a] Water erosion potential rates based on soil erosion factor K, which indicates the susceptibility of soil to sheet and rill erosion by water. Values range from 0.02 to 0.69 and are provided in parentheses under the general rating; a higher value indicates a higher susceptibility to erosion. Estimates based on the percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity. A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions. A rating of "moderate" indicates that erosion could be expected under ordinary climatic conditions.

[b] Wind erosion potential here is based on the wind erodibility group (WEG) designation: groups 1 and 2, high; groups 3 through 6, moderate; and groups 7 and 8, low (see footnote d for further explanation).

[c] To convert from acres to $km^2$, multiply by 0.004047.

**Footnotes continued on next page.**



1

**TABLE 11.4.7.1-1 (Cont.)**

[d] WEGs are based on soil texture, content of organic matter, effervescence of carbonates, content of rock fragments, and mineralogy, and also take into account soil moisture, surface cover, soil surface roughness, wind velocity and direction, and the length of unsheltered distance (USDA 2004). Groups range in value from 1 (most susceptible to wind erosion) to 8 (least susceptible to wind erosion). The NRCS provides a wind erodibility index, expressed as an erosion rate in tons per acre per year, for each of the wind erodibility groups: WEG 1, 220 tons (200 metric tons) per acre (4,000 $m^2$) per year (average); WEG 2, 134 tons (122 metric tons) per acre (4,000 $m^2$) per year; WEGs 3 and 4 (and 4L), 86 tons (78 metric tons) per acre (4,000 $m^2$) per year; WEG 5, 56 tons (51 metric tons) per acre (4,000 $m^2$) per year; WEG 6, 48 tons (44 metric tons) per acre (4,000 $m^2$) per year; WEG 7, 38 tons (34 metric tons) per acre (4,000 $m^2$) per year; and WEG 8, 0 tons (0 metric tons) per acre (4,000 $m^2$) per year.

[e] Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses.

[f] A total of 617 acres (2.5 $km^2$) within the Saltydog–Ambush–Panacker association is currently categorized as a non-development area (denoted by red areas in Figure 11.4.7.1-2).

[g] A total of 3 acres (0.012 $km^2$) within the Koyen–Geer association is currently categorized as a non-development area (denoted by red areas in Figure 11.4.7.1-2).

[h] A total of 2,700 acres (10.9 $km^2$) within the Ewelac–Playas association is currently categorized as a non-development area (denoted by red areas in Figure 11.4.7.1-2).

[i] A total of 6 acres (0.024 $km^2$) within the Ambush–Penoyer association is currently categorized as a non-development area (denoted by red areas in Figure 11.4.7.1-2).

[j] A total of 4 acres (0.016 $km^2$) within the Geer–Penoyer association is currently categorized as a non-development area (denoted by red areas in Figure 11.4.7.1-2).

[k] A total of 1 acre (0.004 $km^2$) within the Saltydog–Geer association is currently categorized as a non-development area (denoted by red areas in Figure 11.4.7.1-2).

[l] A total of 285 acres (0.040 $km^2$) within the Ambush–Panacker–Playas association is currently categorized as a non-development area (denoted by red areas in Figure 11.4.7.1-2).

Source: NRCS (2010).

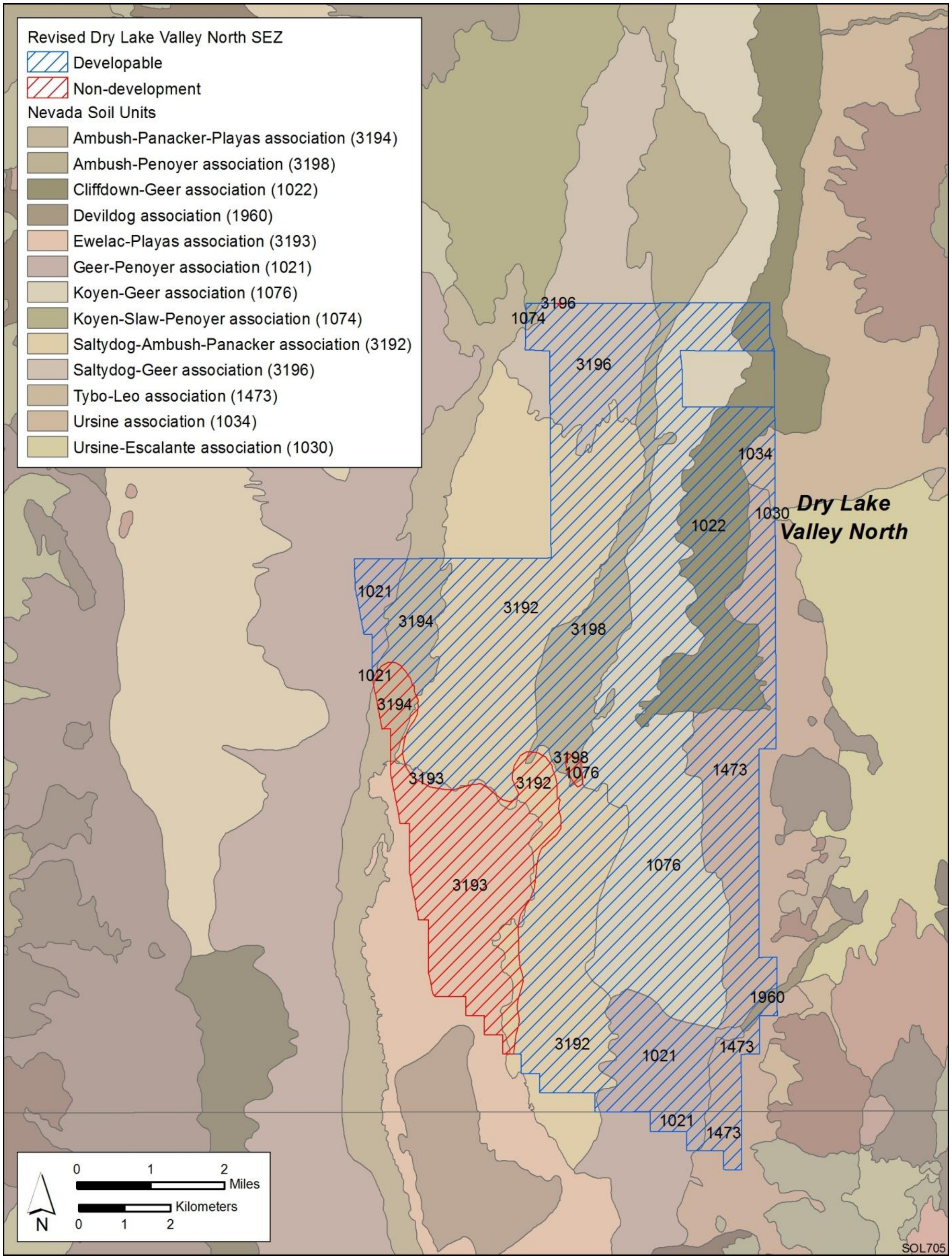


**FIGURE 11.4.7.1-2 Soil Map for the Proposed Dry Lake Valley North SEZ as Revised (Source: NRCS 2008)**

#### 11.4.7.2 Impacts

Impacts on soil resources would occur mainly as a result of ground-disturbing activities (e.g., grading, excavating, and drilling), especially during the construction phase of a solar project. Because impacts on soil resources result from ground-disturbing activities in the project area, soil impacts would be roughly proportional to the size of a given solar facility, with larger areas of disturbed soil having a greater potential for impacts than smaller areas (Section 5.7.2). The assessment provided in the Draft Solar PEIS remains valid, with the following updates:

- Impacts related to wind erodibility are reduced because the identification of new SEZ boundaries and non-development areas eliminates 40,813 acres (165 km$^2$) of moderately erodible soils and 6,999 acres (28 m$^2$) of highly erodible soils (Koyen–Slaw–Penoyer association) from development.

- Impacts related to water erodibility are reduced because the identification of new SEZ boundaries and non-development areas eliminates 33,571 acres (136 km$^2$) of moderately erodible soils and 2,267 acres (9.2 km$^2$) of highly erodible soils (Penoyer–Geer association) from development.

#### 11.4.7.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on soils are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will reduce the potential for soil impacts during all project phases.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for soil resources were identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.4.8 Minerals (Fluids, Solids, and Geothermal Resources)

A mineral potential assessment for the proposed Dry Lake Valley North SEZ has been prepared and reviewed by BLM mineral specialists knowledgeable about the region where the SEZ is located (BLM 2012a). The BLM is proposing to withdraw the SEZ from settlement, sale, location, or entry under the general land laws, including the mining laws, for a period of 20 years (see Section 2.2.2.2.4 of this Final Solar PEIS). The potential impacts of this withdrawal are discussed in Section 11.4.24.

#### 11.4.8.1 Affected Environment

The revised proposed SEZ contains two existing oil and gas leases that are classified as nonproducing. This is a revision of the estimate of six existing leases in the Draft Solar PEIS.

There are no existing mining claims or geothermal leases within the revised SEZ. The rest of the description of the SEZ in the Draft Solar PEIS remains valid.

### 11.4.8.2 Impacts

The two existing oil and gas leases are prior existing rights that would be protected as required under current regulations. For the purpose of this analysis, it was assumed that future development of oil and gas resources would continue to be possible, since such development could occur under the existing leases or from directional drilling from new leases. Since the SEZ does not contain existing mining claims, it was also assumed that there would be no future loss of locatable mineral production. The production of common minerals might take place in the SEZ in areas not directly developed for solar energy production. Since the SEZ has had no history of development of geothermal resources or of leasing interest, it is not anticipated that solar development would adversely affect the development of geothermal resources.

### 11.4.8.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on mineral extraction are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide adequate protection of mineral resources.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features to address impacts on minerals have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.4.9 Water Resources

### 11.4.9.1 Affected Environment

The overall size of the proposed Dry Lake Valley North SEZ has been reduced by 63% from the area described in the Draft Solar PEIS, resulting in a total area of 28,726 acres (116 $km^2$). The description of the affected environment given in the Draft Solar PEIS relevant to water resources at the proposed Dry Lake Valley North SEZ remains valid and is summarized in the following paragraphs.

The Dry Lake Valley North SEZ is within the Central Nevada Desert subbasin of the Great Basin hydrologic region. The SEZ is located in the Dry Lake Valley and is surrounded by uplifted volcanic and carbonate rock mountain ranges. The average precipitation ranges from 7 to 16 in./yr (18 to 41 cm/yr), and the estimated pan evaporation rate is about 80 in./yr (203 cm/yr). No perennial surface water features are present in the SEZ. There is a dry lake that covers an area of approximately 8,064 acres $mi^2$ (33 $km^2$) in the southern portion of the valley. Coyote Wash and Cherry Creek flow from north to south through the SEZ, along with several other intermittent/ephemeral streams and braided channels of alluvial outwash plains in the region. Flood hazards have not been identified for the area surrounding the SEZ, but intermittent flooding may occur along the intermittent/ephemeral washes and within the dry lake area. The Dry Lake Valley groundwater basin consists of basin-fill deposits on the order of 3 mi (5 km) in thickness and is underlain by sequences of carbonate rock aquifers. The carbonate rock aquifers are a part of the White River Groundwater Flow System (a subunit of the Colorado River groundwater system), a regional-scale groundwater system that generally flows southward and terminates at Muddy River Springs, Rogers and Blue Point Springs, and the Virgin River. Estimates of groundwater recharge to the Dry Lake Valley range from 5,000 to 15,667 ac-ft/yr (6.2 to 19 million $m^3$/yr), with a depth to groundwater of more than 400 ft (122 m). The hydraulic gradient in the basin-fill aquifer was estimated to be 0.0025 in a southward direction. Groundwater quality varies in the Dry Lake Valley basin, but high concentrations (exceeding, or near to, the MCL) of arsenic, thallium, and iron have been found in water samples.

All waters in Nevada are public property, and the NDWR is the agency responsible for managing both surface and groundwater resources. The Dry Lake Valley groundwater basin is not a designated groundwater basin; thus there are no specific beneficial uses set by the NDWR. The NDWR sets the perennial yield for each groundwater basin, which is technically the amount of water available for water rights allocations. The Dry Lake Valley groundwater basin's perennial yield was set at 12,700 ac-ft/yr (15.7 million $m^3$/yr) according to State Engineer's Ruling 5875 (NDWR 2008), which also granted a 11,584 ac-ft/yr (14.3 million $m^3$/yr) water right to the SNWA. State Engineer's Ruling 5875 from 2008 and State Engineer's Ruling 5993 (NDWR 2009) from 2009 resulted in a full allocation of water rights in the Dry Lake Valley groundwater basin; however, in October 2009, the Seventh Judicial District Court of Nevada issued an order to vacate the State Engineer's Ruling. The SNWA appealed this decision to the Nevada Supreme Court in November 2009, which resulted in the lower court and the NDWR having to reconsider SNWA's original water rights application (Legislative Council Bureau 2010). The NDWR held a hearing on the water right application in the fall of 2011, and the NDWR issued a decision on March 22, 2012, to grant SNWA's application for 11,584 ac-ft/yr (14.3 million $m^3$/yr) of water (SNWA 2012a; NDWR 2012). Thus, the current estimate of unallocated water rights in the basin is approximately 50 ac-ft (0.06 million $m^3$).

In addition to the water resources information provided in the Draft Solar PEIS, this section provides a planning-level inventory of available climate, surface water, and groundwater monitoring stations within the immediate vicinity of the Dry Lake Valley North SEZ and surrounding basin. Additional data regarding climate, surface water, and groundwater conditions are presented in Tables 11.4.9.1-1 through 11.4.9.1-7 and in Figures 11.4.9.1-1 and 11.4.9.1-2. Fieldwork and hydrologic analyses needed to determine 100-year floodplains and jurisdictional water bodies would need to be coordinated with appropriate federal, state, and local agencies. Areas within the Dry Lake Valley North SEZ that are found to be within a 100-year floodplain will be identified as non-development areas. Any water features within the Dry Lake Valley North SEZ determined to be jurisdictional will be subject to the permitting process described in the CWA.

**TABLE 11.4.9.1-1 Watershed and Water Management Basin Information Relevant to the Proposed Dry Lake Valley North SEZ as Revised**

| Basin | Name | Area (acres)[b] |
|---|---|---|
| Subregion (HUC4)[a] | Central Nevada Desert Basins (1606) | 30,541,691 |
| Cataloging unit (HUC8) | Dry Lake Valley (16060009) | 1,397,948 |
| Groundwater basin | Dry Lake Valley | 564,480 |
| SEZ | Dry Lake Valley North | 28,726 |

[a] HUC = Hydrologic Unit Code; a USGS system for characterizing nested watersheds that includes large-scale subregions (HUC4) and small-scale cataloging units (HUC8).

[b] To convert acres to km$^2$, multiply by 0.004047.

**TABLE 11.4.9.1-2 Climate Station Information Relevant to the Proposed Dry Lake Valley North SEZ as Revised**

| Climate Station (COOP ID[a]) | Elevation[b] (ft)[c] | Distance to SEZ (mi)[d] | Period of Record | Mean Annual Precipitation (in.)[e] | Mean Annual Snowfall (in.) |
|---|---|---|---|---|---|
| Caliente, Nevada (261358) | 4,400 | 19 | 1903–2011 | 8.74 | 11.20 |
| Hiko, Nevada (263671) | 3,900 | 31 | 1989–2011 | 6.96 | 2.60 |
| Key Pittman WMA, Nevada (264143) | 3,950 | 29 | 1964–1989 | 7.94 | 1.50 |
| Lake Valley Steward (264384) | 6,352 | 35 | 1971–1998 | 15.69 | 61.60 |
| Pioche, Nevada (266252) | 6,166 | 18 | 1888–2011 | 13.60 | 35.10 |

[a] National Weather Service's Cooperative Station Network station identification code.

[b] Surface elevations for the proposed Dry Lake Valley North SEZ range from 4,580 to 5,080 ft.

[c] To convert ft to m, multiply by 0.3048.

[d] To convert mi to km, multiply by 1.6093.

[e] To convert in. to cm, multiply by 2.540.

Source: NOAA (2012).

**TABLE 11.4.9.1-3 Total Lengths of Selected Streams at the Subregion, Cataloging Unit, and SEZ Scale Relevant to the Proposed Dry Lake Valley North SEZ as Revised**

| Water Feature | Subregion, HUC4 (ft)[a] | Cataloging Unit, HUC8 (ft) | SEZ (ft) |
|---|---|---|---|
| Unclassified streams | 87,719 | 0 | 0 |
| Perennial streams | 10,923,723 | 91,370 | 0 |
| Intermittent/ephemeral streams | 724,309,083 | 28,634,178 | 422,355 |
| Canals | 4,035,992 | 186,130 | 673 |

[a] To convert ft to m, multiply by 0.3048.

Source: USGS (2012a).

**TABLE 11.4.9.1-4 Stream Discharge Information Relevant to the Proposed Dry Lake Valley North SEZ as Revised**

| Parameter | Station (USGS ID): Dry Lake Valley Tributary near Caliente, Nevada (10245270) |
|---|---|
| Period of record | 1967–1981 |
| No. of observations | 15 |
| Discharge, median ($ft^3/s$)[a] | 0.6 |
| Discharge, range ($ft^3/s$) | 0–156 |
| Discharge, most recent observation ($ft^3/s$) | 0 |
| Distance to SEZ (mi)[b] | 14 |

[a] To convert $ft^3$ to $m^3$, multiply by 0.0283.

[b] To convert mi to km, multiply by 1.6093.

Source: USGS (2012b).

**TABLE 11.4.9.1-5 Surface Water Quality Data Relevant to the Proposed Dry Lake Valley North SEZ as Revised**

| | Station (USGS ID)[a] | | |
|---|---|---|---|
| Parameter | 375443114550501 | 381358114412201 | 381506114421801 |
| Period of record | 2004 | 2004 | 2004 |
| No. of records | 1 | 1 | 1 |
| Temperature (°C)[b] | 12.1 | 14.9 | 14.4 |
| Total dissolved solids (mg/L) | 226 | 314 | 317 |
| Dissolved oxygen (mg/L) | 8.3 | 5 | 6.9 |
| pH | 7.6 | 7 | 7.2 |
| Total nitrogen (mg/L) | NA[c] | NA | NA |
| Phosphorus (mg/L as P) | NA | NA | NA |
| Organic carbon (mg/L) | NA | NA | NA |
| Calcium (mg/L) | 36.7 | 67.1 | 68.1 |
| Magnesium (mg/L) | 7.98 | 13.3 | 12.2 |
| Sodium (mg/L) | 16.1 | 16.3 | 16.4 |
| Chloride (mg/L) | 13.9 | 22.5 | 24.9 |
| Sulfate (mg/L) | 15.9 | 20.9 | 18.1 |
| Arsenic (µg/L) | NA | NA | NA |

[a] Median values are listed.

[b] To convert °C to °F, multiply by 1.8, then add 32.

[c] NA = no data collected for this parameter.

Source: USGS (2102b).

## 11.4.9.2 Impacts

### *11.4.9.2.1 Land Disturbance Impacts on Water Resources*

The discussion of land disturbance effects on water resources in the Draft Solar PEIS remains valid. As stated in the Draft Solar PEIS, land disturbance impacts in the vicinity of the proposed Dry Lake Valley North SEZ could potentially affect drainage patterns, along with groundwater recharge and discharge properties. The alteration of natural drainage pathways during construction can lead to impacts related to flooding, loss of water delivery to downstream regions, and alterations to riparian vegetation and habitats. The alteration of the SEZ boundaries to exclude the 100-year floodplain area that included Dry Lake and two intermittent/ephemeral streams reduces the potential for adverse impacts associated with land disturbance activities.

Land clearing, land leveling, and vegetation removal during the development of the SEZ have the potential to disrupt intermittent/ephemeral stream channels. Several programmatic design features described in Section A.2.2 of Appendix A of this Final Solar PEIS would avoid, minimize, and/or mitigate the impacts associated with the disruption of intermittent/ephemeral

**TABLE 11.4.9.1-6 Water Quality Data from Groundwater Samples Relevant to the Proposed Dry Lake Valley North SEZ as Revised**

| | Station (USGS ID)[a] |
|---|---|
| Parameter | 380531114534201 |
| Period of record | 2003 |
| No. of records | 1 |
| Temperature (°C)[b] | 29.8 |
| Total dissolved solids (mg/L) | 377 |
| Dissolved oxygen (mg/L) | 0.2 |
| pH | 6.9 |
| Nitrate + nitrite (mg/L as N) | 0.05 |
| Phosphate (mg/L) | 0.031 |
| Organic carbon (mg/L) | 0.5 |
| Calcium (mg/L) | 79.7 |
| Magnesium (mg/L) | 30.1 |
| Sodium (mg/L) | 18.8 |
| Chloride (mg/L) | 6.37 |
| Sulfate (mg/L) | 21.1 |
| Arsenic (µg/L) | 11.5 |
| Iron (µg/L) | 1,890 |
| Thallium (µg/L) | 2.55 |

[a] Median values are listed.

[b] To convert °C to °F, multiply by 1.8, then add 32.

Source: USGS (2012b).

water features. Additional analyses of intermittent/ephemeral streams are presented in this update, including an evaluation of functional aspects of stream channels with respect to groundwater recharge, flood conveyance, sediment transport, geomorphology, and ecological habitats. Only a summary of the results from these surface water analyses is presented in this section; more information on methods and results is presented in Appendix O.

The study region considered for the intermittent/ephemeral stream evaluation relevant to the Dry Lake Valley North SEZ is a subset of the Dry Lake Valley watershed (HUC8), for which information regarding stream channels is presented in Tables 11.4.9.1-3 and 11.4.9.1-4 of this Final Solar PEIS. The results of the intermittent/ephemeral stream evaluation are shown in Figure 11.4.9.2-1, which depicts a subset of flow lines from the National Hydrography Dataset (USGS 2012a) labeled as having a low, moderate, or high sensitivity to land disturbance (Figure 11.4.9.2-1). The analysis indicated that 19% of the total length of the intermittent/ ephemeral stream channel reaches in the evaluation had low sensitivity, and 81% had moderate sensitivity. Several intermittent/ephemeral channels within the SEZ were classified as having

**TABLE 11.4.9.1-7 Groundwater Surface Elevations Relevant to the Proposed Dry Lake Valley North SEZ as Revised**

| | Station (USGS ID) | | |
|---|---|---|---|
| Parameter | 375624114444501 | 380336114473501 | 374536114443001 |
| Period of record | 1990–2011 | 2005–2010 | 1983–1990 |
| Number of observations | 14 | 5 | 2 |
| Surface elevation (ft)[a] | 4,692 | 5,000 | 4,675 |
| Well depth (ft) | NA[c] | 742 | 156 |
| Depth to water, median (ft) | 393.3 | 658.15 | 42.24 |
| Depth to water, min/max (ft) | 42.62–398.24 | 658–659.64 | 39.03–45.44 |
| Depth to water, most recent observation (ft) | 394.18 | 658.05 | 45.44 |
| Distance to SEZ (mi)[b] | 8 | 17 | 4 |

[a] To convert ft to m, multiply by 0.3048.

[b] To convert mi to km, multiply by 1.6093.

[c] NA = data not available.

Source: USGS (2012b).

moderate sensitivity to land disturbance. The northeastern potion of the SEZ has a particularly dense aggregation of intermittent/ephemeral channels classified as having moderate sensitivity to disturbance (Figure 11.4.9.2-1).

### *11.4.9.2.2 Water Use Requirements for Solar Energy Technologies*

Changes in the Dry Lake Valley North boundaries resulted in significant changes to the estimated water use requirements during construction and operations. This section presents changes in water use estimates for the reduced SEZ area and additional analyses pertaining to groundwater. The additional analyses of groundwater include a basin-scale groundwater budget and a simplified, one-dimensional groundwater model of potential groundwater drawdown. Only a summary of the results from these groundwater analyses is presented in this section; more information on methods and results is presented in Appendix O.

Table 11.4.9.2-1 presents the revised estimates of water requirements for both construction and operation of solar facilities at the Dry Lake Valley North SEZ, assuming full build-out of the SEZ and accounting for its decreased size. A basin-scale groundwater budget was assembled by using available data on groundwater inputs, outputs, and storage; results are presented in Table 11.4.9.2-2.

The estimated total water use requirements during the peak construction year are as high as 2,814 ac-ft/yr (3.5 million $m^3$/yr), which is 56% of the low estimate of average annual recharge to the basin. Groundwater withdrawals are not reported for the basin, but currently

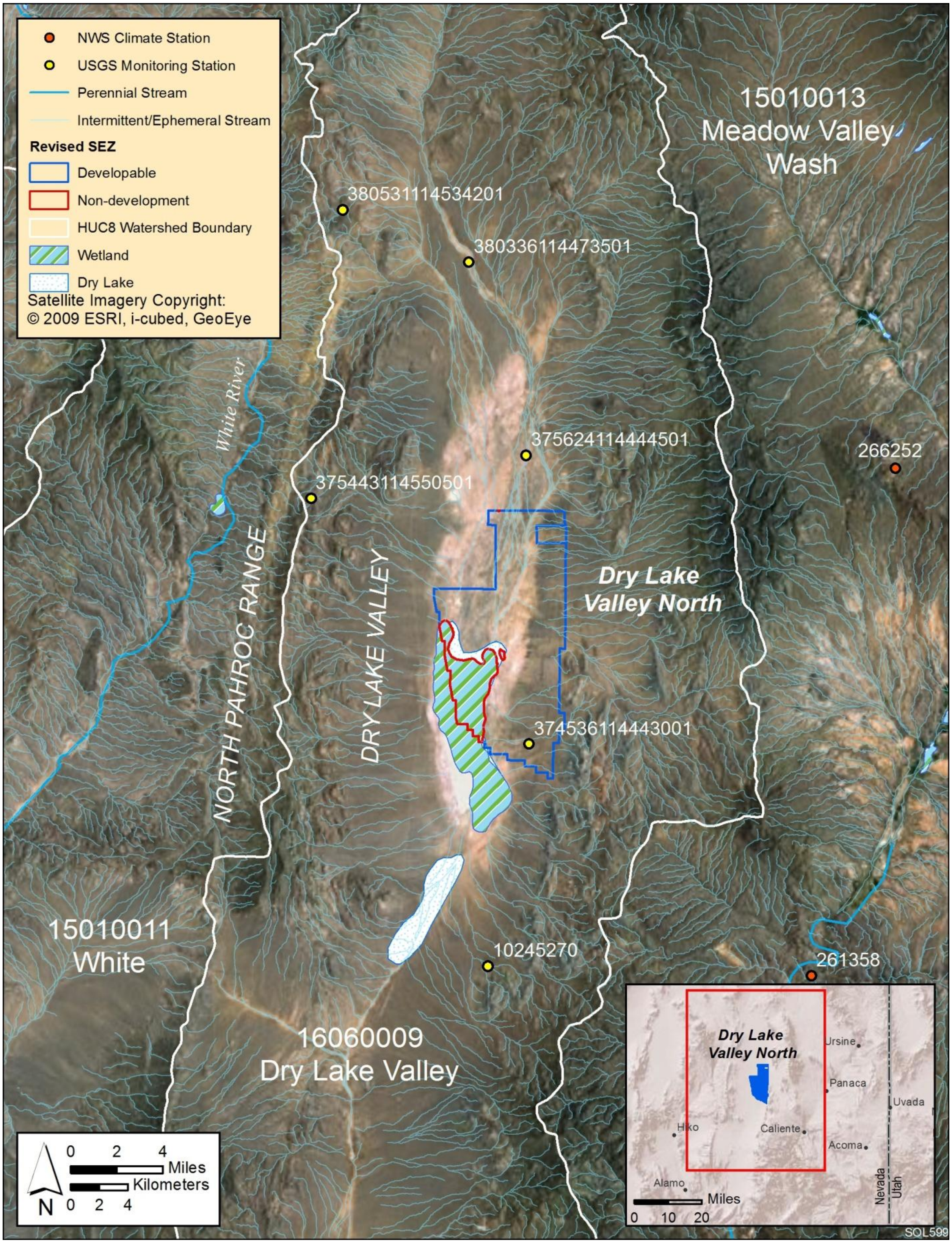


**FIGURE 11.4.9.1-1 Water Features near the Proposed Dry Lake Valley North SEZ as Revised**

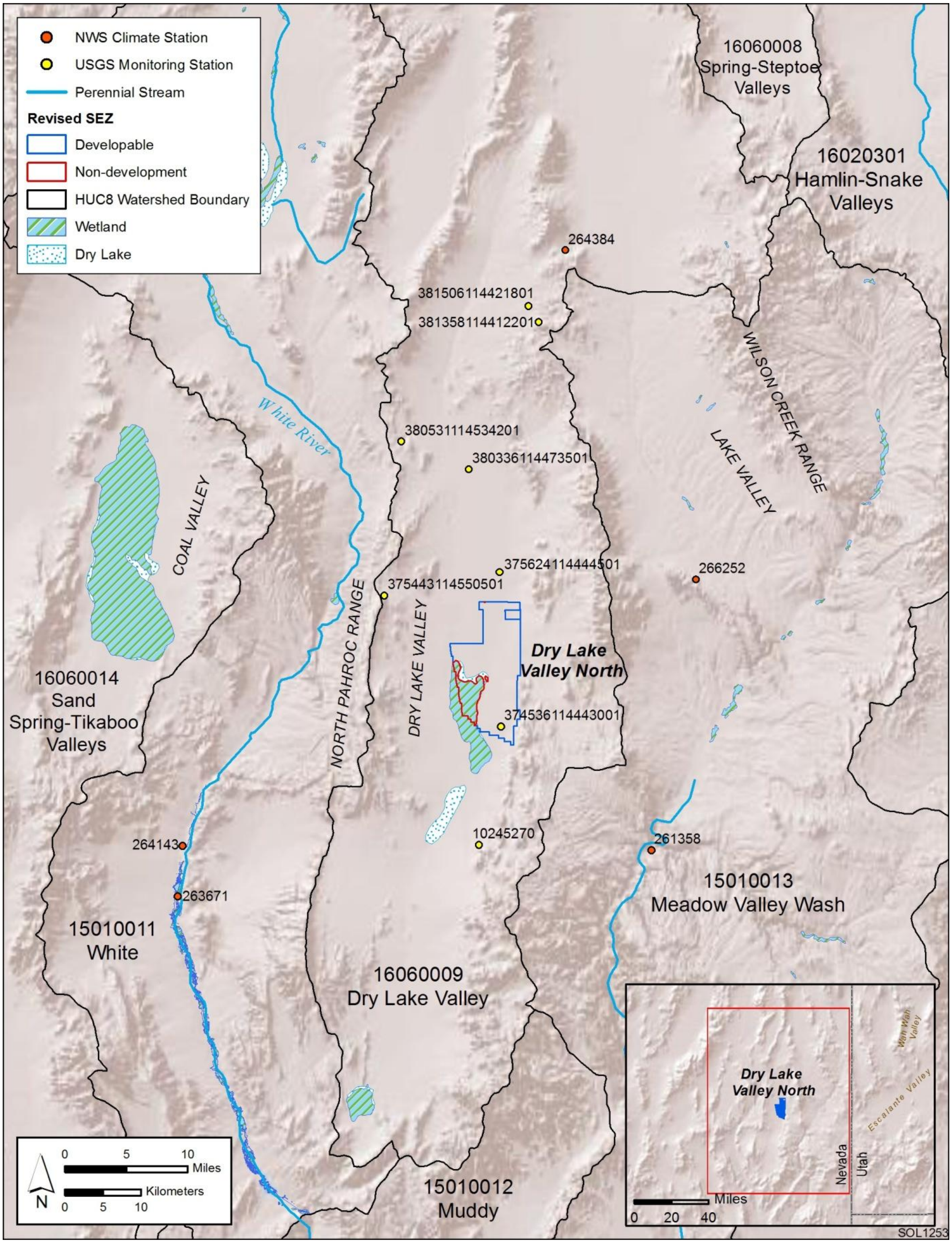


**FIGURE 11.4.9.1-2 Water Features within the Dry Lake Valley Watershed, Which Includes the Proposed Dry Lake Valley North SEZ as Revised**

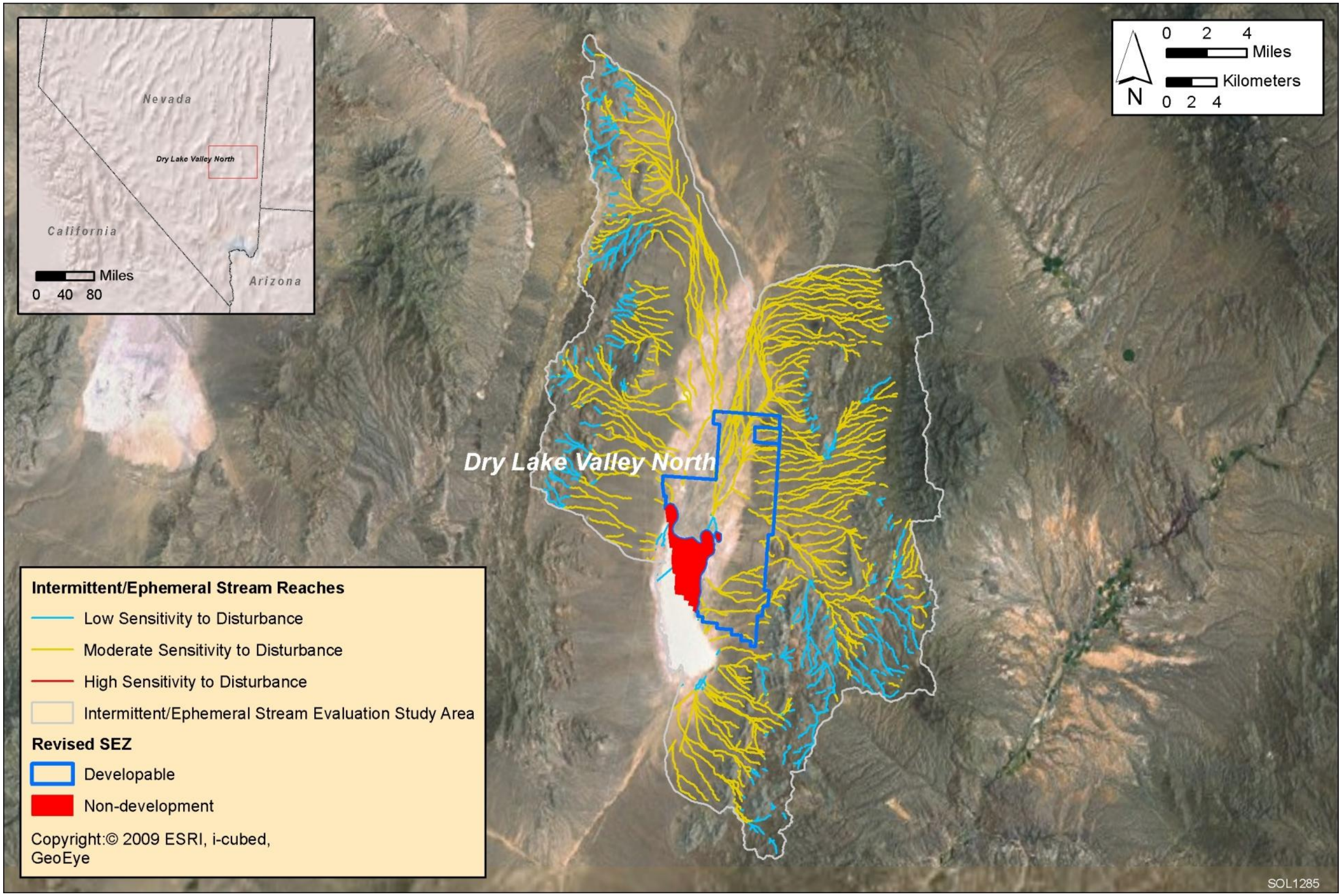


**FIGURE 11.4.9.2-1 Intermittent/Ephemeral Stream Channel Sensitivity to Surface Disturbances in the Vicinity of the Proposed Dry Lake Valley North SEZ as Revised**

**TABLE 11.4.9.2-1 Estimated Water Requirements for the Proposed Dry Lake Valley North SEZ as Revised[a]**

| Activity | Parabolic Trough | Power Tower | Dish Engine | PV |
|---|---|---|---|---|
| **Construction—Peak Year** | | | | |
| *Water use requirements* | | | | |
| Fugitive dust control (ac-ft)[b] | 1,816 | 2,724 | 2,724 | 2,724 |
| Potable supply for workforce (ac-ft) | 148 | 90 | 37 | 19 |
| Total water use requirements (ac-ft) | 1,964 | 2,814 | 2,761 | 2,743 |
| *Wastewater generated* | | | | |
| Sanitary wastewater (ac-ft) | 148 | 90 | 37 | 19 |
| **Operations** | | | | |
| *Water use requirements* | | | | |
| Mirror/panel washing (ac-ft/yr) | 2,006 | 1,114 | 1,114 | 111 |
| Potable supply for workforce (ac-ft/yr) | 56 | 25 | 25 | 2 |
| Dry cooling (ac-ft/yr) | 802–4,011 | 446–2,228 | NA | NA |
| Wet cooling (ac-ft/yr) | 18,050–58,160 | 10,028–32,311 | NA | NA |
| *Total water use requirements* | | | | |
| Non-cooled technologies (ac-ft/yr) | NA[c] | NA | 1,139 | 114 |
| Dry-cooled technologies (ac-ft/yr) | 2,864–6,073 | 1,585–3,367 | NA | NA |
| Wet-cooled technologies (ac-ft/yr) | 20,112–60,222 | 11,167–33,450 | NA | NA |
| *Wastewater generated* | | | | |
| Blowdown (ac-ft/yr) | 1,139 | 633 | NA | NA |
| Sanitary wastewater (ac-ft/yr) | 56 | 25 | 25 | 2 |

[a] See Section M.9.2 of Appendix M and Tables 10.3.9.2-1 and 10.3.9.2-2 of the Draft Solar PEIS for methods used in estimating water use requirements.

[b] To convert ac-ft to $m^3$, multiply by 1,234.

[c] NA = not applicable.

the Dry Lake Valley basin has 12,649 ac-ft/yr (15.6 million $m^3$/yr) of permitted water rights (NDWR 2010, 2012). Given the short duration of construction activities, the water use estimate for construction is not a primary concern for water resources in the basin. The long duration of groundwater pumping during operations (20 years) poses a greater threat to groundwater resources. This analysis considered low, medium, and high groundwater pumping scenarios that represent full build-out of the SEZ assuming PV, dry-cooled parabolic trough, and wet-cooled parabolic trough, respectively (a 30% operational time was considered for all solar facility types on the basis of operations estimates for proposed utility-scale solar energy facilities).

The low, medium, and high pumping scenarios result in groundwater withdrawals that range from 114 to 20,112 ac-ft/yr (0.14 to 24.8 million $m^3$/yr), or 2,280 to 402,220 ac-ft (2.8 to 496 million $m^3$) over the 20-year operational period. From a groundwater budgeting perspective,

**TABLE 11.4.9.2-2 Groundwater Budget for the Garnet Valley Groundwater Basin, Which Includes the Proposed Dry Lake Valley North SEZ as Revised**

| Process | Amount |
|---|---|
| *Inputs* | |
| Recharge (ac-ft/yr)[a,b] | 5,000–15,667[c,d,e] |
| *Outputs* | |
| Underflow to Delamar Valley (ac-ft/yr) | 5,000[c] |
| *Storage* | |
| Perennial yield (ac-ft/yr) | 12,700[f] |

[a] Groundwater recharge includes mountain front, intermittent/ephemeral channel seepage, and direct infiltration recharge processes.

[b] To convert ac-ft to $m^3$, multiply by 1,234.

[c] Eakin (1963).

[d] Flint et al. (2004).

[e] NDWR (2008).

[f] Defined by NDWR.

Source: Rush (1968).

the high pumping scenario would represent four times the low estimate of groundwater recharge to the basin. The low and medium pumping scenarios have annual withdrawals that represent 2% and 57%, respectively, of the estimate of groundwater inputs to the basin (Table 11.4.9.2-2). Increases in groundwater extraction from the basin could impair other users and affect ecological habitats.

Groundwater budgeting allows for quantification of complex groundwater processes at the basin scale, but it ignores the temporal and spatial components of how groundwater withdrawals affect groundwater surface elevations, groundwater flow rates, and connectivity to surface water features such as streams, wetlands, playas, and riparian vegetation. A one-dimensional groundwater modeling analysis was performed to present a simplified depiction of the spatial and temporal effects of groundwater withdrawals by examining groundwater drawdown in a radial direction around the center of the SEZ for the low, medium, and high pumping scenarios. A detailed discussion of the groundwater modeling analysis is presented in Appendix O. Note, however, that the aquifer parameters used for the one-dimensional groundwater model (Table 11.4.9.2-3) represent available literature data, and that the model aggregates these value ranges into a simplistic representation of the aquifer.

**TABLE 11.4.9.2-3 Aquifer Characteristics and Assumptions Used in the One-Dimensional Groundwater Model for the Proposed Dry Lake Valley North SEZ as Revised**

| Parameter | Value |
|---|---|
| Aquifer type/conditions | Basin/unconfined |
| Aquifer thickness (ft) | 6,560[b] |
| Hydraulic conductivity (ft/day) | 4[c] |
| Transmissivity ($ft^2$/day) | 26,200 |
| Specific yield | 0.1[c] |
| Analysis period (yr) | 20 |
| High pumping scenario (ac-ft/yr)[a] | 20,112 |
| Medium pumping scenario (ac-ft/yr) | 2,864 |
| Low pumping scenario (ac-ft/yr) | 114 |

[a] To convert ac-ft to $m^3$, multiply by 1,234.

[b] Mankinen et al. (2008).

[c] Ertec Western, Inc. (1981).

Currently, the depth to groundwater ranges from 45 to 394 ft (14 to 120 m) in the vicinity of the SEZ (Table 11.4.9.1-7). The modeling results suggest that groundwater withdrawals for solar energy development would result in groundwater drawdown in the vicinity of the SEZ (approximately a 5-mi [8-km] radius) that ranges from 6 to more than 30 ft (1.8 to 9 m) for the high pumping scenario, 1 to 5 ft (0.3 to 1.5 m) for the medium pumping scenario, and less than 1 ft (0.3 m) for the low pumping scenario (Figure 11.4.9.2-2). The modeled groundwater drawdown for the high pumping scenario suggests a potential for 10 ft (3 m) of drawdown at a distance of 2 mi (3.2 km) from the center of the SEZ, which could impair groundwater-surface water connectivity via infiltration processes during channel inundation, along with alterations to the wetlands in the dry lake and the riparian vegetation along the unnamed intermittent/ ephemeral streams throughout the SEZ that drain toward the dry lake.

#### *11.4.9.2.3 Off-Site Impacts: Roads and Transmission Lines*

As stated in the Draft Solar PEIS, impacts associated with the construction of roads and transmission lines primarily deal with water use demands for construction, water quality concerns relating to potential chemical spills, and land disturbance effects on the natural hydrology. Water needed for transmission line construction activities (e.g., for soil compaction, dust suppression, and potable supply for workers) could be trucked to the construction area from an off-site source. If this occurred, water use impacts at the SEZ would be negligible. The Draft Solar PEIS assessment of impacts on water resources from road and transmission line construction remains valid.

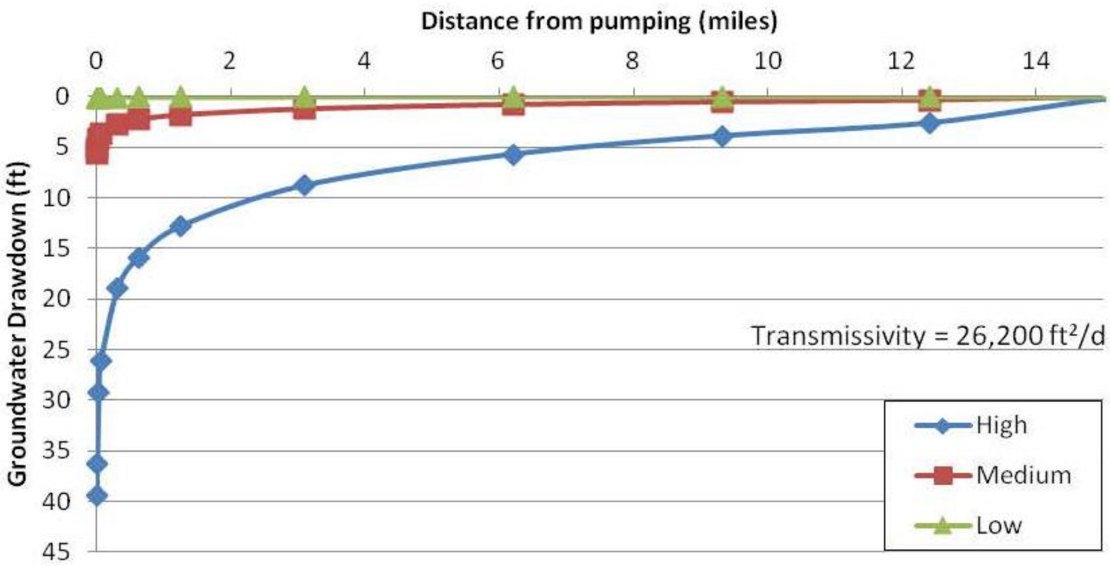


**FIGURE 11.4.9.2-2 Estimated One-Dimensional Groundwater Drawdown Resulting from High, Medium, and Low Groundwater Pumping Scenarios over the 20-Year Operational Period at the Proposed Dry Lake Valley North SEZ as Revised**

#### *11.4.9.2.4 Summary of Impacts on Water Resources*

The additional information and analyses of water resources presented in this update agree with the information provided in the Draft Solar PEIS, which indicates that the Dry Lake Valley North SEZ is located in a desert valley with predominantly intermittent/ephemeral surface water features and groundwater in a basin-fill aquifer overlaying a regional-scale carbonate rock aquifer system. The NDWR set the perennial yield for Dry Lake Valley at 12,700 ac-ft/yr (15.7 million $m^3$/yr), and this is the basis on which the NDWR (2012) has recently granted water rights that result in a full allocation of the perennial yield of the basin. These baseline conditions suggest that water resources are scarce in the vicinity of the Dry Lake Valley North SEZ and that the primary potential for impacts resulting from solar energy development comes from surface disturbances and groundwater use.

The change in boundaries of the Dry Lake Valley North SEZ resulted in a decrease in total water demand by approximately 65% for all technologies (Table 11.4.9.2-1), and the areas excluded from the SEZ contain the dry lake and the associated wetlands in the southwest corner of the SEZ as revised. These changes in the SEZ boundaries have reduced potential impacts on surface water features associated with groundwater withdrawal and surface disturbance.

Disturbance to intermittent/ephemeral stream channels within the Dry Lake Valley North SEZ could have an impact on the critical functions of groundwater recharge, sediment transport, flood conveyance, and ecological habitat in the vicinity of the SEZ. The intermittent/ephemeral stream evaluation suggests that several intermittent/ephemeral channels within the SEZ have a moderate sensitivity to disturbance. Surface disturbances within the Dry Lake Valley North SEZ could also lead to impacts within upstream and downstream reaches of unnamed intermittent/ephemeral streams that flow through the SEZ. Several design features described in Section A.2.2. of Appendix A of this Final Solar PEIS specify measures to reduce impacts on intermittent/ephemeral water features.

The proposed water use requirements for full build-out scenarios at the Dry Lake Valley North SEZ indicate that the low pumping scenario is preferable, given that the medium and high pumping scenarios have the potential to greatly affect both the annual and long-term groundwater budget, and that the high pumping scenario may impair potential groundwater-surface water connectivity in Dry Lake and the unnamed intermittent/ephemeral streams throughout the SEZ. The availability of groundwater in the Dry Lake Valley North basin will largely depend on water rights availability and decisions made by the NDWR.

Predicting impacts associated with groundwater withdrawal in desert regions is often difficult given the heterogeneity of aquifer characteristics, the long time period between the onset of pumping and its effects, and limited data. One of the primary mitigation measures to protect water resources is the implementation of long-term monitoring and adaptive management (see Section A.2.4 of Appendix A). For groundwater, this requires a combination of monitoring and modeling to fully identify the temporal and spatial extent of potential impacts. The BLM is currently working on the development of a more detailed numerical groundwater model for the Dry Lake Valley North SEZ that would more accurately predict potential impacts on surface water features and groundwater drawdown. When the detailed model is completed, it will be made available through the project Web site (http://solareis.anl.gov) for use by applicants, the BLM, and other stakeholders.

#### 11.4.9.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on surface water and groundwater are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some protection of and reduce impacts on water resources.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature for water resources has been identified:

- Groundwater analyses suggest that full build-out of dry-cooled and wet-cooled technologies is not feasible; for mixed-technology development scenarios, any proposed dry- or wet-cooled projects should utilize water conservation practices.

The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.4.10 Vegetation

#### 11.4.10.1 Affected Environment

As presented in Section 11.4.10.1 of the Draft Solar PEIS, 13 cover types were identified within the area of the proposed Dry Lake Valley North SEZ, while 24 cover types were identified in the area of indirect impacts. Sensitive habitats on the SEZ include desert dry washes, wetland, and playa. As the result of the changes in SEZ boundaries and the access road assumption, the Inter-Mountain Basins Big Sagebrush Steppe, Undifferentiated Barren Land, Sonora-Mojave Creosotebush-White Bursage Desert Scrub, and North American Arid West Emergent Marsh cover types no longer occur within the SEZ. Also, the Inter-Mountain Basins Curl-leaf Mountain Mahogany woodland and Shrubland, Inter-Mountain Basins Subalpine Limber-Bristlecone Pine Woodland, Great Basin Foothill and Lower Montane Riparian Woodland and Shrubland, Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland, Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland, Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland cover types no longer occur within the indirect impact area (access road corridor and within 5 mi (8 km) of the SEZ boundary). Figure 11.4.10.1-1 shows the cover types within the affected area of the Dry Lake Valley North SEZ as revised.

#### 11.4.10.2 Impacts

As presented in the Draft Solar PEIS, the construction of solar energy facilities within the proposed Dry Lake Valley North SEZ would result in direct impacts on plant communities because of the removal of vegetation within the facility footprint during land-clearing and land-grading operations. Approximately 80% of the SEZ would be expected to be cleared with full development of the SEZ. As a result of the changes to the proposed SEZ boundaries, approximately 20,055 acres (81 $km^2$) would be cleared. In addition, approximately 58 acres (0.2 $km^2$) could be directly affected by the assumed access road, although the new access road corridor includes an existing gravel road that could be upgraded.

Overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the cover type within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of a cover type would be lost; and (3) *large*: >10% of a cover type would be lost.

##### *11.4.10.2.1 Impacts on Native Species*

The analysis presented in the Draft Solar PEIS for the original Dry Lake Valley North SEZ boundaries indicated that development would result in a large impact on five land cover types, a moderate impact on two land cover types, and a small impact on all other land cover types occurring within the SEZ (Table 11.4.10.1-1 in the Draft Solar PEIS). Development within the revised Dry Lake Valley North SEZ could still directly affect most of the cover types

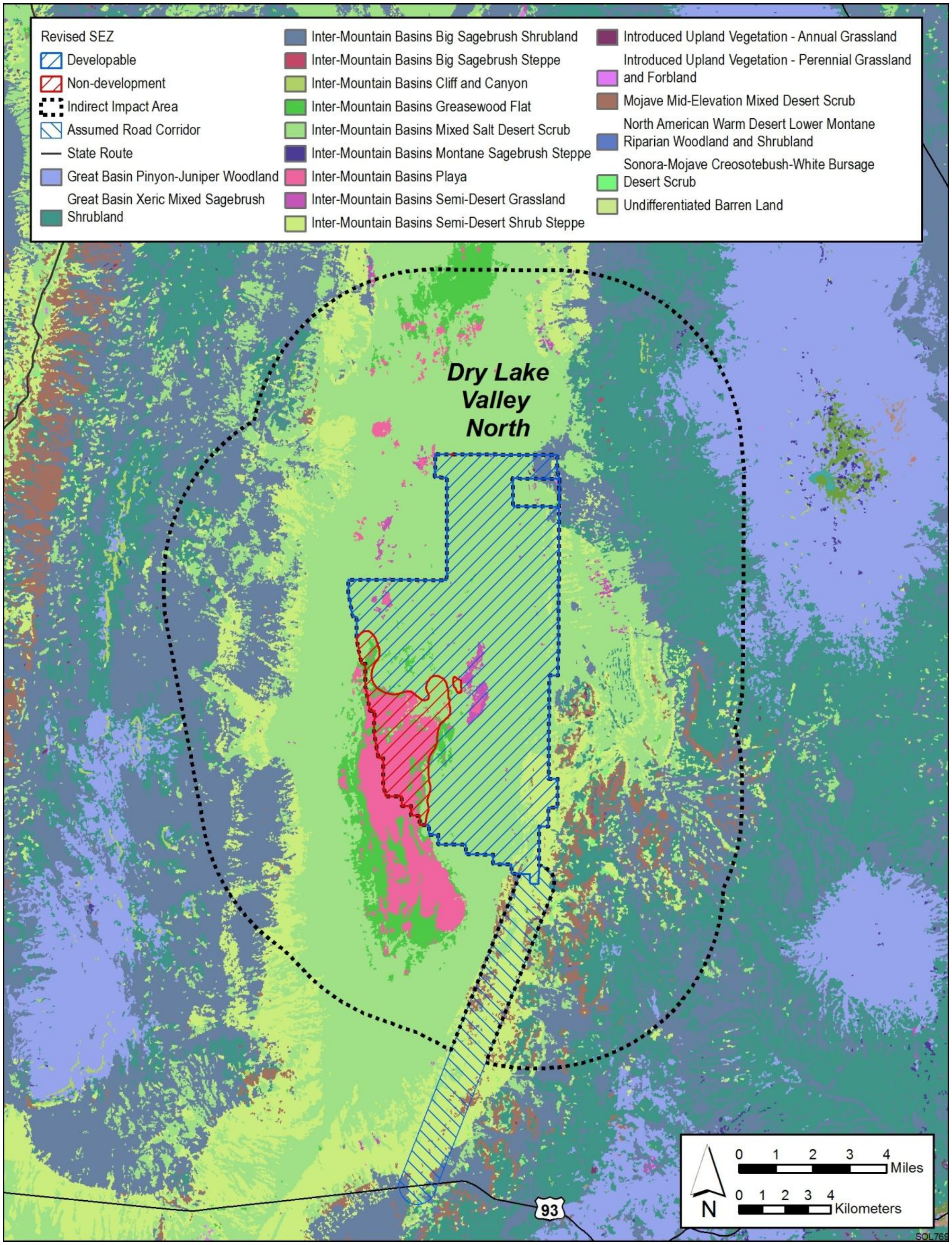


**FIGURE 11.4.10.1-1 Land Cover Types within the Proposed Dry Lake Valley North SEZ as Revised**

evaluated in the Draft Solar PEIS, with the exception of Inter-Mountain Basins Big Sagebrush Steppe (previously large impact), Undifferentiated Barren Land (previously large impact), Sonora-Mojave Creosotebush-White Bursage Desert Scrub, and North American Arid West Emergent Marsh; the reduction in the developable area would result in reduced impact levels on all cover types in the affected area. The impact magnitude on Inter-Mountain Basins Playa (previously large impact), Inter-Mountain Basins Semi-Desert Shrub Steppe (previously moderate impact), and Inter-Mountain Basins Greasewood Flat (previously moderate impact), would be reduced to a small impact; Inter-Mountain Basins Mixed Salt Desert Scrub (previously large impact) and Inter-Mountain Basins Semi-Desert Grassland (previously large impact) would be reduced to a moderate impact. The impact magnitudes on all other cover types would remain unchanged compared to original estimates in the Draft Solar PEIS.

The Inter-Mountain Basins Cliff and Canyon, Sonora-Mojave Creosotebush-White Bursage Desert Scrub, and Inter-Mountain Basins Greasewood Flat cover types, previously not directly affected by the access road, could be directly affected by the access road because of the revised route. However, the Inter-Mountain Basins Big Sagebrush Steppe cover type would no longer be directly affected by the access road. Because of the change in the indirect impact area assumed location, the Inter-Mountain Basins Curl-leaf Mountain Mahogany woodland and Shrubland, Inter-Mountain Basins Subalpine Limber-Bristlecone Pine Woodland, Great Basin Foothill and Lower Montane Riparian Woodland and Shrubland, Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland, Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland, Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland cover types would not be indirectly affected.

Indirect impacts on habitats associated with the playa, wetlands, or dry washes, including Coyote Wash, within or near the SEZ, as described in the Draft Solar PEIS, could occur. The indirect impacts from groundwater use on plant communities in the region that depend on groundwater could also occur.

#### *11.4.10.2.2 Impacts from Noxious Weeds and Invasive Plant Species*

As presented in the Draft Solar PEIS, land disturbance from project activities and indirect effects of construction and operation within the Dry Lake Valley North SEZ could potentially result in the establishment or expansion of noxious weeds and invasive species populations, potentially including those species listed in Section 11.4.10.1 of the Draft Solar PEIS. Impacts such as reduced restoration success and possible widespread habitat degradation could still occur; however, a small reduction in the potential for such impacts would result from the reduced developable area of the SEZ.

### 11.4.10.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on vegetation are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific species and habitats will determine how programmatic design features are applied, for example:

- Dry washes, playas, and wetlands within the SEZ, and dry washes within the access road corridor shall be avoided to the extent practicable, and any impacts minimized and mitigated in consultation with appropriate agencies. A buffer area shall be maintained around wetlands, playas, and dry washes to reduce the potential for impacts.

- Appropriate engineering controls shall be used to minimize impacts on dry wash, playa, marsh, scrub-shrub wetland, riparian, and greasewood flat habitats, including occurrences downstream of solar projects or assumed access road, resulting from surface water runoff, erosion, sedimentation, altered hydrology, accidental spills, or fugitive dust deposition to these habitats. Appropriate buffers and engineering controls will be determined through agency consultation.

- Groundwater withdrawals shall be limited to reduce the potential for indirect impacts on groundwater-dependent communities, habitats dependent on springs associated with the Dry Lake Valley basin, Delamar Valley Basin, or other hydrologically connected basins. Potential impacts on springs shall be determined through hydrological studies.

It is anticipated that implementation of these programmatic design features will reduce a high potential for impacts from invasive species and impacts on dry washes, playas, springs, riparian habitats, and wetlands to a minimal potential for impact. Residual impacts on groundwater-dependent habitats could result from limited groundwater withdrawal and the like; however, it is anticipated that these impacts would be avoided in the majority of instances.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.4.11 Wildlife and Aquatic Biota

For the assessment of potential impacts on wildlife and aquatic biota, overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the species' habitat within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of the species' habitat would be lost; and (3) *large*: >10% of the species' habitat would be lost.

### 11.4.11.1 Amphibians and Reptiles

#### *11.4.11.1.1 Affected Environment*

As presented in Section 11.4.11.1 of the Draft Solar PEIS, representative amphibian and reptile species expected to occur within the Dry Lake Valley North SEZ include the Great Plains toad (*Bufo cognatus*), red-spotted toad (*Bufo punctatus*), desert horned lizard (*Phrynosoma platyrhinos*), Great Basin collared lizard (*Crotaphytus bicinctores*), long-nosed leopard lizard (*Gambelia wislizenii*), side-blotched lizard (*Uta stansburiana*), western fence lizard (*Sceloporus occidentalis*), western whiptail (*Cnemidophorus tigris*), zebra-tailed lizard (*Callisaurus draconoides*), coachwhip (*Masticophis flagellum*), glossy snake (*Arizona elegans*), gophersnake (*Pituophis catenifer*), groundsnake (*Sonora semiannulata*), nightsnake (*Hypsiglena torquata*), and sidewinder (*Crotalus cerastes*). The reduction in the size of the Dry Lake Valley North SEZ does not alter the potential for these species to occur in the affected area.

#### *11.4.11.1.2 Impacts*

As presented in the Draft Solar PEIS, solar energy development within the Dry Lake Valley North SEZ could affect potentially suitable habitats for the representative amphibian and reptile species. The analysis presented in the Draft Solar PEIS for the original Dry Lake Valley North SEZ boundaries indicated that development would result in a small impact on the side-blotched lizard, coachwhip, glossy snake, gophersnake, groundsnake, and sidewinder; and a moderate impact on the remainder of the representative amphibian and reptile species (Table 11.4.11.1-1 in the Draft Solar PEIS). The reduction in the developable area of the Dry Lake Valley North SEZ would result in reduced habitat impacts for all representative amphibian and reptile species. The resultant impact levels for most of the representative amphibian and reptile species would be small except for the Great Basin collared lizard and zebra-tailed lizard, for which the impact levels would remain moderate.

#### *11.4.11.1.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on amphibian and reptile species are described in Section A.2.2 of Appendix A of this Final Solar PEIS. With the implementation of required programmatic design features, impacts on amphibian and reptile species will be reduced.

Because of the changes to the SEZ boundaries, the SEZ-specific design feature identified in Section 11.4.11.1.3 of the Draft Solar PEIS (i.e., dry lake and wash habitats should be avoided) is no longer applicable. On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for amphibians and reptile species have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.4.11.2 Birds

#### *11.4.11.2.1 Affected Environment*

As presented in Section 11.4.11.2.1 of the Draft Solar PEIS, a large number of bird species could occur or have potentially suitable habitat within the affected area of the proposed Dry Lake Valley North SEZ. Representative bird species identified in the Draft Solar PEIS included (1) shorebirds: killdeer (*Charadrius vociferus*); (2) passerines: ash-throated flycatcher (*Myiarchus cinerascens*), Bewick's wren (*Thryomanes bewickii*), black-throated sparrow (*Amphispiza bilineata*), cactus wren (*Campylorhynchus brunneicapillus*), common poorwill (*Phalaenoptilus nuttallii*), common raven (*Corvus corax*), Costa's hummingbird (*Calypte costae*), greater roadrunner (*Geococcyx californianus*), horned lark (*Eremophila alpestris*), ladder-backed woodpecker (*Picoides scalaris*), Le Conte's thrasher (*Toxostoma lecontei*), lesser nighthawk (*Chordeiles acutipennis*), loggerhead shrike (*Lanius ludovicianus*), northern mockingbird (*Mimus polyglottos*), rock wren (*Salpinctes obsoletus*), sage sparrow (*Amphispiza belli*), Say's phoebe (*Sayornis saya*), verdin (*Auriparus flaviceps*), and western kingbird (*Tyrannus verticalis*); (3) raptors: American kestrel (*Falco sparverius*), golden eagle (*Aquila chrysaetos*), great horned owl (*Bubo virginianus*), long-eared owl (*Asio otus*), red-tailed hawk (*Buteo jamaicensis*), and turkey vulture (*Cathartes aura*); and (4) upland gamebirds: chukar (*Alectoris chukar*), Gambel's quail (*Callipepla gambelii*), mourning dove (*Zenaida macroura*), white-winged dove (*Zenaida asiatica*), and wild turkey (*Meleagris gallopavo*). The reduction in the size of the Dry Lake Valley North SEZ does not alter the potential for these species or other bird species to occur in the affected area.

#### *11.4.11.2.2 Impacts*

As presented in the Draft Solar PEIS, solar energy development within the Dry Lake Valley North SEZ could affect potentially suitable bird habitats. The analysis presented in the Draft Solar PEIS based on the original Dry Lake Valley North SEZ boundaries indicated that development would result in a small impact on Bewick's wren, black-throated sparrow, cactus wren, Costa's hummingbird, Say's phoebe, verdin, Gambel's quail, white-winged dove, and wild turkey; and a moderate impact on the remainder of the representative bird species (Table 11.4.11.2-1 in the Draft Solar PEIS). The reduction in the developable area of the Dry Lake Valley North SEZ would result in reduced habitat impacts for all representative bird species. The resultant impact levels for most of the representative bird species would be small except for the Le Conte's thrasher, for which the impact level would remain moderate.

#### *11.4.11.2.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on bird species are described in Section A.2.2 of Appendix A of this Final Solar PEIS. With the implementation of required programmatic design features, impacts on bird species will be reduced.

Because of the change in boundaries of the SEZ, the SEZ-specific design feature identified in Section 11.4.11.2.3 of the Draft Solar PEIS (i.e., dry lake and wash habitats should be avoided) is no longer applicable. On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for birds have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.4.11.3 Mammals

#### *11.4.11.3.1 Affected Environment*

As presented in Section 11.4.11.3.1 of the Draft Solar PEIS, a large number of mammal species were identified that could occur or have potentially suitable habitat within the affected area of the proposed Dry Lake Valley North SEZ. Representative mammal species identified in the Draft Solar PEIS included (1) big game species: cougar (*Puma concolor*), elk (*Cervis canadensis*), mule deer (*Odocoileus hemionus*), and pronghorn (*Antilocapra americana*); (2) furbearers and small game species: the American badger (*Taxidea taxus*), black-tailed jackrabbit (*Lepus californicus*), bobcat (*Lynx rufus*), coyote (*Canis latrans*, common), desert cottontail (*Sylvilagus audubonii*), gray fox (*Urocyon cinereoargenteus*), kit fox (*Vulpes macrotis*), and red fox (*Vulpes vulpes*); and (3) small nongame species: Botta's pocket gopher (*Thomomys bottae*), cactus mouse (*Peromyscus eremicus*), canyon mouse (*P. crinitis*), deer mouse (*P. maniculatus*), desert shrew (*Notiosorex crawfordi*), desert woodrat (*Neotoma lepida*), little pocket mouse (*Perognathus longimembris*), long-tailed pocket mouse (*Chaetodipus formosus*), Merriam's pocket mouse (*Dipodomys merriami*), northern grasshopper mouse (*Onychomys leucogaster*), southern grasshopper mouse (*O. torridus*), western harvest mouse (*Reithrodontomys megalotis*), and white-tailed antelope squirrel (*Ammospermophilus leucurus*). Bat species that may occur within the area of the SEZ include the big brown bat (*Eptesicus fuscus*), Brazilian free-tailed bat (*Tadarida brasiliensis*), California myotis (*Myotis californicus*), hoary bat (*Lasiurus cinereus*), long-legged myotis (*M. volans*), silver-haired bat (*Lasionycteris noctivagans*), and western pipistrelle (*Parastrellus hesperus*). The reduction in the size of the Dry Lake Valley North SEZ does not alter the potential for these species or any additional mammal species to occur in the affected area.

#### *11.4.11.3.2 Impacts*

As presented in the Draft Solar PEIS, solar energy development within the Dry Lake Valley North SEZ could affect potentially suitable habitats of mammal species. The analysis presented in the Draft Solar PEIS based on the original Dry Lake Valley North SEZ boundaries indicated that development would result in a small impact on elk, pronghorn, bobcat, red fox, cactus mouse, canyon mouse, hoary bat, and northern grasshopper mouse; and a moderate impact on the remainder of the representative mammal species analyzed (Table 11.4.11.3-1 in the Draft Solar PEIS). On the basis of mapped activity areas, up to 61,499 acres (248.9 km$^2$) of year-round pronghorn habitat would be directly affected by solar energy development within the SEZ (Figure 11.4.11.3-3 of the Draft Solar PEIS). This is about 3.2% of the year-round habitat mapped within the SEZ region and would be considered a moderate impact. Because of the reduction in size of the Dry Lake Valley North SEZ, only 20,055 acres (81.2 $km^2$) of year-round habitat would be affected. This is about 1.0% of the year-round habitat mapped within the SEZ region and would be considered a small impact. The reduction in the developable area of the Dry Lake Valley North SEZ would result in reduced habitat impacts for all representative mammal species. Resultant impact levels for most of the representative mammal species would be small except for the desert shrew and southern grasshopper mouse, for which impact levels would remain moderate.

#### *11.4.11.3.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on mammals are described in Section A.2.2 of Appendix A of this Final Solar PEIS. With the implementation of required programmatic design features and the applicable SEZ-specific design features, impacts on mammal species will be reduced.

Because of the change in boundaries of the SEZ, one of the SEZ-specific design features identified in Section 11.4.11.3.3 of the Draft Solar PEIS (i.e., playa and wash habitats should be avoided) is no longer applicable. On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature for mammals has been identified:

- The fencing around the solar energy development should not block the free movement of mammals, particularly big game species.

If SEZ-specific design features are implemented in addition to required programmatic design features, impacts on mammal species would be small. The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.4.11.4 Aquatic Biota

#### *11.4.11.4.1 Affected Environment*

There are no perennial surface water bodies or perennial streams within the proposed Dry Lake Valley North SEZ or within the assumed road corridor. The boundaries of the Dry Lake Valley North SEZ have been reduced compared to the boundaries given in the Draft Solar PEIS. On the basis of these changes, updates to the Draft Solar PEIS include:

- 6 mi (10 km) of the intermittent/ephemeral Coyote Wash and 2 mi (3 km) of unnamed washes cross through the SEZ.

- 938 acres (4 $km^2$) of an unnamed dry lake is present within the SEZ.

- 3,477 acres (14 $km^2$) of dry lake and 18 mi (29 km) of intermittent washes are located within the area of SEZ indirect effects within 5-mi (8 km) of the SEZ.

- Outside of the potential indirect effects area, but within 50 mi (80 km) of the SEZ, are 146 mi (235 km) of perennial stream and 403 mi (649 km) of intermittent streams.

Aquatic biota present in the surface water features in the SEZ have not been characterized. As stated in Appendix C of the Supplement to the Draft Solar PEIS, site surveys can be conducted at the project-specific level to characterize the aquatic biota, if present, in washes, dry lakes, and wetlands within the SEZ.

#### *11.4.11.4.2 Impacts*

The types of impacts on aquatic habitats and biota that could occur from the development of utility-scale solar energy facilities are discussed in Section 5.10.3 of the Draft and Final Solar PEIS. Aquatic habitats could be affected by solar energy development in a number of ways, including (1) direct disturbance, (2) deposition of sediments, (3) changes in water quantity, and (4) degradation of water quality. The impact assessment provided in the Draft Solar PEIS remains valid, with the following updates:

- The amount of surface water features within the Dry Lake Valley North SEZ that could potentially be affected by solar energy development is less because the size of the SEZ has been reduced.

- The dry lakes and associated wetlands within the Dry Lake Valley North SEZ have been identified as non-development areas; therefore, construction activities would not directly affect these features. However, as described in the Draft Solar PEIS, the wetlands could be affected indirectly by solar development activities within the SEZ.

#### *11.4.11.4.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on aquatic biota are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific resources and conditions will guide how programmatic design features are applied, for example:

- Appropriate engineering controls shall be implemented to minimize the amount of contaminants and sediment entering Coyote Wash and the unnamed washes and dry lakes within the SEZ.

- Development shall avoid any additional wetlands identified during future site-specific fieldwork.

It is anticipated that implementation of the programmatic design features will reduce impacts on aquatic biota, and if the utilization of water from groundwater or surface water sources is adequately controlled to maintain sufficient water levels in nearby aquatic habitats, the potential impacts on aquatic biota from solar energy development at the Dry Lake Valley North SEZ would be small.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features have been identified for aquatic biota. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.4.12 Special Status Species

### 11.4.12.1 Affected Environment

As presented in the Draft Solar PEIS, 22 special status species were identified that could occur or have potentially suitable habitat within the affected area of the proposed Dry Lake Valley North SEZ. The reduction in the size of the Dry Lake Valley North SEZ does not alter the potential for these species to occur in the affected area, but it may reduce the magnitude of impacts for some species with moderate or large impacts as determined in the Draft Solar PEIS. The 13 special status species that were determined to have moderate or large impacts in the Draft Solar PEIS are re-evaluated here. Groundwater-dependent species are not discussed here, because the changes to the SEZ boundary are not assumed to alter the impact determination for groundwater-dependent species. The 13 special status species re-evaluated in this section are (1) plants: Blaine fishhook cactus (*Sclerocactus blaneii*), Eastwood milkvetch (*Asclepias eastwoodiana*), long-calyx milkvetch (*Astragalus oophorus* var. *lonchocalyx*), Needle Mountains milkvetch (*Astragalus eurylobus*), Pioche blazingstar (*Mentzelia argillicola*), and Tiehm blazingstar (*Mentzelia tiehmii*); (2) birds: prairie falcon (*Falco mexicanus*), western burrowing owl (*Athene cunicularia hypugaea*), and western snowy plover (*Charadrius alexandrinus nivosus*); and (3) mammals: Desert Valley kangaroo mouse (*Microdipodops megacephalus albiventer*), fringed myotis (*Myotis thysanodes*), Pahranagat Valley montane vole (*Microtus montanus fucosus*), and western small-footed myotis (*Myotis ciliolabrum*).

Since publication of the Draft Solar PEIS, 11 additional special status species have been identified that could potentially occur in the affected area based on county-level occurrences and the presence of potentially suitable habitat. These 11 special status species are all designated sensitive species by the Nevada BLM office and include (1) birds: golden eagle, gray vireo (*Vireo vicinior*), loggerhead shrike, and long-eared owl; and (2) mammals: big brown bat, Brazilian free-tailed bat, California myotis, hoary bat, long-legged myotis, silver-haired bat, and western pipistrelle. These additional species are discussed below, along with a re-evaluation of those species determined to have moderate or large impacts in the Draft Solar PEIS.

**Blaine Fishhook Cactus.** The Blaine fishhook cactus is a small cactus endemic to southeastern Nevada and southwestern Utah, where it occurs on alkaline substrates and volcanic gravels in valley bottoms. This species was analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. Only three occurrences of this species are currently known. One of these occurrences is in the Dry Lake Valley (Stout 2009). Potentially suitable habitat for this species occurs on the Dry Lake Valley North SEZ and in other portions of the affected area (Table 11.4.12.1-1).

**Eastwood Milkweed.** The Eastwood milkweed is a perennial forb endemic to Nevada from public and private lands in Esmeralda, Lander, Lincoln, and Nye Counties. This species was analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. It occurs in open areas on a wide variety of basic (pH usually >8) soils, including calcareous clay knolls, sand, carbonate or basaltic gravels, washes, or shale outcrops at elevations between 4,700 and 7,100 ft (1,430 and 2,150 m). The species is known to occur on the SEZ. Potentially suitable habitat for this species occurs on the Dry Lake Valley North SEZ, assumed access road corridor, and other portions of the affected area (Table 11.4.12.1-1).

**Long-Calyx Milkvetch.** The long-calyx milkvetch is a perennial forb regionally endemic to the Great Basin in southwestern Utah and eastern Nevada. This species was analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. It occurs in pinyon-juniper woodlands, sagebrush, and mixed shrub communities at elevations between 5,800 and 7,500 ft (1,760 and 2,290 m). The species is known to occur 8 mi (13 km) east of the SEZ. Potentially suitable habitat for this species occurs on the Dry Lake Valley North SEZ, assumed access road corridor, and other portions of the affected area (Table 11.4.12.1-1).

**Needle Mountains Milkvetch.** The Needle Mountains milkvetch is a perennial forb that occurs on gravel washes and sandy soils in alkaline desert and arid grasslands at elevations between 4,250 and 6,250 ft (1,295 and 1,900 m). This species was analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. The species is known to occur about 15 mi (24 km) southeast of the SEZ. Potentially suitable habitat for this species occurs on the Dry Lake Valley North SEZ and other portions of the affected area (Table 11.4.12.1-1).

**Pioche Blazingstar.** The Pioche blazingstar is a perennial forb endemic to Nevada. This species was analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. It occurs on dry, soft, silty clay soils on knolls and slopes with sparse vegetation consisting mainly of

**TABLE 11.4.12.1-1 Habitats, Potential Impacts, and Potential Mitigation for Special Status Species That Could Be Affected by Solar Energy Development on the Proposed Dry Lake Valley North SEZ as Revised[a]**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Maximum Area of Potential Habitat Affected[d]: Access Road (Direct Effects)[f] | Maximum Area of Potential Habitat Affected[d]: Outside SEZ (Indirect Effects)[g] | Overall Impact Magnitude[h] and Species-Specific Mitigation[i] |
|---|---|---|---|---|---|---|---|
| ***Plants*** | | | | | | | |
| **Blaine fishhook cactus[j]** | ***Sclerocactus blaneii*** | BLM-S; NV-P; FWS-SC; NV-S1 | Endemic to southeastern Nevada and southwestern Utah on alkaline substrates and volcanic gravels in valley bottoms. Elevation ranges between 5,100 and 5,300 ft.[k] There are only three known occurrences of this species. One of these occurrences is located in the Dry Lake Valley. About 20,150 acres[l] of potentially suitable habitat occurs within the SEZ region. | 132 acres of potentially suitable habitat lost (0.7% of available potentially suitable habitat) | 0 acres | 3,500 acres of potentially suitable habitat (17.4% of available potentially suitable habitat) | Small overall impact. Avoiding or minimizing disturbance to playa habitat could reduce impacts. In addition, pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats in the area of direct effects; translocation of individuals from the area of direct effects; or compensatory mitigation of direct effects on occupied habitats could reduce impacts. |

**TABLE 11.4.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Access Road (Direct Effects)[f] | Outside SEZ (Indirect Effects)[g] | Overall Impact Magnitude[h] and Species-Specific Mitigation[i] |
|---|---|---|---|---|---|---|---|
| ***Plants (Cont.)*** | | | | | | | |
| **Eastwood milkweed** | ***Asclepias eastwoodiana*** | BLM-S; FWS-SC; NV-S2 | Endemic to Nevada on public and private lands in Esmeralda, Lander, Lincoln, and Nye Counties in open areas on a wide variety of basic (pH usually >8) soils, including calcareous clay knolls, sand, carbonate, or basaltic gravels, or shale outcrops, generally barren and lacking competition. Frequently in small washes or other moisture-accumulating microsites at elevations between 4,700 and 7,100 ft. Known to occur on the SEZ. About 413,100 acres of potentially suitable habitat occurs within the SEZ region. | 1,865 acres of potentially suitable habitat lost (0.5% of available potentially suitable habitat) | 5 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 27,800 acres of potentially suitable habitat (6.7% of available potentially suitable habitat) | Small overall impact. Pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats in the area of direct effects; translocation of individuals from the area of direct effects; or compensatory mitigation of direct effects on occupied habitats could reduce impacts. Note that these same potential mitigations apply to all special status plants. |

**TABLE 11.4.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Access Road (Direct Effects)[f] | Outside SEZ (Indirect Effects)[g] | Overall Impact Magnitude[h] and Species-Specific Mitigation[i] |
|---|---|---|---|---|---|---|---|
| ***Plants (Cont.)*** | | | | | | | |
| Long-calyx milkvetch | *Astragalus oophorus var. lonchocalyx* | BLM-S; FWS-SC; NV-S2 | Regionally endemic to the Great Basin in western Utah and eastern Nevada in pinyon-juniper woodlands, sagebrush, and mixed shrub communities at elevations between 5,800 and 7,500 ft. Nearest recorded occurrence is 8 mi[m] east of the SEZ. About 4,350,000 acres of potentially suitable habitat occurs within the SEZ region. | 18,000 acres of potentially suitable habitat lost (0.4% of available potentially suitable habitat) | 40 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 124,000 acres of potentially suitable habitat (2.9% of available potentially suitable habitat) | Small overall impact. See Eastwood milkweed for a list of other potential mitigations. |
| Needle Mountains milkvetch | *Astragalus eurylobus* | BLM-S; FWS-SC; NV-S2 | Gravel washes and sandy soils in alkaline desert and arid grasslands at elevations between 4,250 and 6,250 ft. Nearest recorded occurrence is 15 mi southeast of the SEZ. About 42,100 acres of potentially suitable habitat occurs within the SEZ region. | 500 acres of potentially suitable habitat lost (1.2% of available potentially suitable habitat) | 0 acres | 7,250 acres of potentially suitable habitat (17.2% of available potentially suitable habitat) | Moderate overall impact. Avoiding or minimizing disturbance to playa habitat could reduce impacts. In addition, see the Eastwood milkweed for a list of other potential mitigations. |

**TABLE 11.4.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Access Road (Direct Effects)[f] | Outside SEZ (Indirect Effects)[g] | Overall Impact Magnitude[h] and Species-Specific Mitigation[i] |
|---|---|---|---|---|---|---|---|
| ***Plants (Cont.)*** | | | | | | | |
| Pioche blazingstar | *Mentzelia argillicola* | BLM-S; NV-S1 | Endemic to Nevada on dry, soft, silty clay soils on knolls and slopes with sparse vegetation consisting mainly of sagebrush. Nearest recorded occurrence is from Patterson Wash, approximately 12 mi east of the SEZ. About 2,869,000 acres of potentially suitable habitat occurs within the SEZ region. | 20,000 acres of potentially suitable habitat lost (0.7% of available potentially suitable habitat) | 46 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 146,250 acres of potentially suitable habitat (5.1% of available potentially suitable habitat) | Small overall impact. See Eastwood milkweed for a list of other potential mitigation. |
| Tiehm blazingstar | *Mentzelia tiehmii* | BLM-S; NV-S1 | Endemic to Nevada on hilltops of white soil, sparsely vegetated white calcareous knolls and bluffs with scattered perennials. Nearest recorded occurrence is from the White River, approximately 7 mi west of the SEZ. About 2,326,100 acres of potentially suitable habitat occurs within the SEZ region. | 20,000 acres of potentially suitable habitat lost (0.9% of available potentially suitable habitat) | 40 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 120,000 acres of potentially suitable habitat (5.2% of available potentially suitable habitat) | Small overall impact. See Eastwood milkweed for a list of other potential mitigations. |

**TABLE 11.4.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Access Road (Direct Effects)[f] | Outside SEZ (Indirect Effects)[g] | Overall Impact Magnitude[h] and Species-Specific Mitigation[i] |
|---|---|---|---|---|---|---|---|
| ***Birds*** | | | | | | | |
| Golden eagle | *Aquila chrysaetos* | BLM-S | An uncommon to common permanent resident and migrant in southern Nevada. Habitat includes rolling foothills, mountain areas, and desert shrublands. Nests on cliff faces and in large trees in open areas. About 4,900,000 acres of potentially suitable habitat occurs within the SEZ region. | 24,890 acres of potentially suitable habitat lost (0.5% of available potentially suitable habitat) | 60 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 143,800 acres of potentially suitable habitat (2.9% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| Gray vireo | *Vireo vicinior* | BLM-S | An uncommon summer resident in arid environments such as pinyon-juniper, chaparral, and desert shrublands. Builds open-cup nests of plant material in forked branches of shrubs or small trees. About 1,625,000 acres of potentially suitable habitat occurs within the SEZ region. | 0 acres | 0 acres | 3,150 acres of potentially suitable habitat (0.2% of available potentially suitable habitat) | Small overall impact; no direct effects. No species-specific mitigation is warranted. |

**TABLE 11.4.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Access Road (Direct Effects)[f] | Outside SEZ (Indirect Effects)[g] | Overall Impact Magnitude[h] and Species-Specific Mitigation[i] |
|---|---|---|---|---|---|---|---|
| ***Birds (Cont.)*** | | | | | | | |
| Loggerhead shrike | *Lanius ludovicianus* | BLM-S | A common winter resident in lowlands and foothills in southern Nevada. Prefers open habitats with shrubs, trees, utility lines, or other perches. Highest density occurs in open-canopied foothill forests. About 5,000,000 acres of potentially suitable habitat occurs within the SEZ region. | 24,900 acres of potentially suitable habitat lost (0.5% of available potentially suitable habitat) | 60 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 140,000 acres of potentially suitable habitat (2.8% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| Long-eared owl | *Asio otus* | BLM-S | An uncommon yearlong resident in southern Nevada. Occurs in desert shrubland environments in proximity to riparian areas such as desert washes. Nests in trees using old nests from other birds or squirrels. About 4,870,000 acres of potentially suitable habitat occurs within the SEZ region. | 24,890 acres of potentially suitable habitat lost (0.5% of available potentially suitable habitat) | 60 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 149,450 acres of potentially suitable habitat (3.1% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |

**TABLE 11.4.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Access Road (Direct Effects)[f] | Outside SEZ (Indirect Effects)[g] | Overall Impact Magnitude[h] and Species-Specific Mitigation[i] |
|---|---|---|---|---|---|---|---|
| ***Birds (Cont.)*** | | | | | | | |
| Prairie falcon | *Falco mexicanus* | BLM-S | Year-round resident in open habitats in mountainous areas, steppe, grasslands, or cultivated areas. Typically nests in well-sheltered ledges of rocky cliffs and outcrops. Known to occur in Lincoln County, Nevada. About 1,690,150 acres of potentially suitable habitat occurs within the SEZ region. | 24,000 acres of potentially suitable habitat lost (1.4% of available potentially suitable habitat) | 30 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 140,000 acres of potentially suitable habitat (8.2% of available potentially suitable habitat) | Moderate overall impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effect. |
| Western burrowing owl | *Athene cunicularia hypugaea* | BLM-S; FWS-SC | Summer breeding resident in open grasslands and prairies, as well as disturbed sites such as golf courses, cemeteries, and airports. Nests in burrows constructed by mammals (especially prairie dogs and badgers). Known to nest on or in the vicinity of the SEZ. About 3,159,500 acres of potentially suitable habitat occurs within the SEZ region. | 24,600 acres of potentially suitable habitat lost (0.8% of available potentially suitable habitat) | 50 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 145,000 acres of potentially suitable habitat (4.6% of available potentially suitable habitat) | Small overall impact on foraging and nesting habitat. Pre-disturbance surveys and avoidance or minimization of disturbance to occupied burrows in the area of direct effects or compensatory mitigation of direct effects on occupied habitats could reduce impacts. |

**TABLE 11.4.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Access Road (Direct Effects)[f] | Outside SEZ (Indirect Effects)[g] | Overall Impact Magnitude[h] and Species-Specific Mitigation[i] |
|---|---|---|---|---|---|---|---|
| ***Birds (Cont.)*** | | | | | | | |
| Western snowy plover | *Charadrius alexandrinus nivosus* | BLM-S; NV-P | Summer breeding resident on alkali flats around reservoirs and sandy shorelines. Nearest recorded occurrence is from the Adams-McGill Reservoir, approximately 23 mi northwest of the SEZ. About 66,000 acres of potentially suitable habitat occurs within the SEZ region. | 250 acres of potentially suitable habitat lost (0.4% of available potentially suitable habitat) | 0 acres | 5,000 acres of potentially suitable habitat (7.5% of available potentially suitable habitat) | Small overall impact on foraging and nesting habitat. Pre-disturbance surveys and avoidance or minimization of disturbance to playa habitats and other occupied habitats in the area of direct effects (particularly associated with the playa habitat on the SEZ) or compensatory mitigation of direct effects on occupied habitats could reduce impacts. |

**TABLE 11.4.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Access Road (Direct Effects)[f] | Outside SEZ (Indirect Effects)[g] | Overall Impact Magnitude[h] and Species-Specific Mitigation[i] |
|---|---|---|---|---|---|---|---|
| ***Mammals*** | | | | | | | |
| Big brown bat | *Eptesicus fuscus* | BLM-S | Occurs throughout the southwestern United States in various habitat types. Uncommon in hot desert environments, but may occur in areas in close proximity to water sources such as lakes and washes. Roosts in buildings, caves, mines, and trees. About 2,673,000 acres of potentially suitable habitat occurs within the SEZ region. | 24,840 acres of potentially suitable habitat lost (0.9% of available potentially suitable habitat) | 50 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 89,200 acres of potentially suitable habitat (3.3% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| Brazilian free-tailed bat | *Tadarida brasiliensis* | BLM-S | A fairly common year-round resident in southern Nevada. Occurs in a variety of habitats, including woodlands, shrublands, and grasslands. Roosts in caves, crevices, and buildings. About 4,120,000 acres of potentially suitable habitat occurs within the SEZ region. | 25,050 acres of potentially suitable habitat lost (0.6% of available potentially suitable habitat) | 53 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 120,000 acres of potentially suitable habitat (2.9% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |

**TABLE 11.4.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Access Road (Direct Effects)[f] | Outside SEZ (Indirect Effects)[g] | Overall Impact Magnitude[h] and Species-Specific Mitigation[i] |
|---|---|---|---|---|---|---|---|
| ***Mammals (Cont.)*** | | | | | | | |
| California myotis | *Myotis californicus* | BLM-S | A common year-round resident in southern Nevada. Occurs in a variety of habitats, including desert, chaparral, woodlands, and forests. Roosts primarily in crevices, but will also use buildings, mines, and hollow trees. About 2,550,000 acres of potentially suitable habitat occurs within the SEZ region. | 25,050 acres of potentially suitable habitat lost (1.0% of available potentially suitable habitat) | 53 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 117,000 acres of potentially suitable habitat (4.6% of available potentially suitable habitat) | Moderate overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |

**TABLE 11.4.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Access Road (Direct Effects)[f] | Outside SEZ (Indirect Effects)[g] | Overall Impact Magnitude[h] and Species-Specific Mitigation[i] |
|---|---|---|---|---|---|---|---|
| ***Mammals (Cont.)*** | | | | | | | |
| **Desert Valley kangaroo mouse** | ***Microdipodops megacephalus albiventer*** | BLM-S; NV-P; FWS-SC; NV-S2 | Endemic to central Nevada in desert areas at playa margins and in dune habitats. Known to occur on the SEZ in association with the dry lake along the southwestern portion of the SEZ. About 1,257,700 acres of potentially suitable habitat occurs within the SEZ region. | 24,000 acres of potentially suitable habitat lost (1.9% of available potentially suitable habitat) | 17 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 60,000 acres of potentially suitable habitat (4.8% of available potentially suitable habitat) | Moderate overall impact. Avoiding or minimizing disturbance to playa habitats within the SEZ could reduce impacts. In addition, pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats in the areas of direct effects or compensatory mitigation of direct effects on occupied habitats could reduce impacts. |

**TABLE 11.4.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Access Road (Direct Effects)[f] | Outside SEZ (Indirect Effects)[g] | Overall Impact Magnitude[h] and Species-Specific Mitigation[i] |
|---|---|---|---|---|---|---|---|
| ***Mammals (Cont.)*** | | | | | | | |
| Fringed myotis | *Myotis thysanodes* | BLM-S; NV-P; FWS-SC; NV-S2 | Year-round resident in a wide range of habitats, including lowland riparian, desert shrub, pinyon-juniper, and sagebrush habitats. Roosts in buildings and caves. Known to occur in Lincoln County, Nevada. About 4,650,000 acres of potentially suitable habitat occurs within the SEZ region. | 410 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 10 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 80,000 acres of potentially suitable habitat (2.7% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effect. |
| Hoary bat | *Lasiurus cinereus* | BLM-S | The most widespread North American bat species occurs throughout southern Nevada in various habitat types. Occurs in habitats such as woodlands, foothills, desert shrublands, and chaparral. Roosts primarily in trees. About 2,100,000 acres of potentially suitable habitat occurs within the SEZ region. | 24,000 acres of potentially suitable habitat lost (1.1% of available potentially suitable habitat) | 45 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 65,000 acres of potentially suitable habitat (3.1% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effect. |

**TABLE 11.4.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Access Road (Direct Effects)[f] | Outside SEZ (Indirect Effects)[g] | Overall Impact Magnitude[h] and Species-Specific Mitigation[i] |
|---|---|---|---|---|---|---|---|
| ***Mammals (Cont.)*** | | | | | | | |
| Long-legged myotis | *Myotis volans* | BLM-S | Common to uncommon year-round resident in southern Nevada. Uncommon in desert and arid grassland environments. Most common in woodlands above 4,000-ft elevation. Forages in chaparral, scrub, woodlands, and desert shrublands. Roosts in trees, caves, and crevices. About 2,730,000 acres of potentially suitable habitat occurs within the SEZ region. | 24,850 acres of potentially suitable habitat lost (0.9% of available potentially suitable habitat) | 51 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 90,000 acres of potentially suitable habitat (3.3% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effect. |

**TABLE 11.4.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Access Road (Direct Effects)[f] | Outside SEZ (Indirect Effects)[g] | Overall Impact Magnitude[h] and Species-Specific Mitigation[i] |
|---|---|---|---|---|---|---|---|
| ***Mammals (Cont.)*** | | | | | | | |
| Pahranagat Valley montane vole | *Microtus montanus fucosus* | BLM-S; NV-P; FWS-SC; NV-S2 | Endemic to Lincoln County, Nevada, where it is restricted to springs in the Pahranagat Valley. Within that area, isolated populations utilize mesic montane and desert riparian patches. Nearest recorded occurrence is from Pahranagat Creek, approximately 27 mi southwest of the SEZ. About 23,900 acres of potentially suitable habitat occurs within the SEZ region. | 410 acres of potentially suitable habitat lost (1.7% of available potentially suitable habitat) | 0 acres | 6,850 acres of potentially suitable habitat (28.6% of available potentially suitable habitat) | Moderate overall impact. Avoiding or minimizing disturbance to playas within the SEZ could reduce impacts. In addition, pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats in the areas of direct effects or compensatory mitigation of direct effects on occupied habitats could reduce impacts. |

## TABLE 11.4.12.1-1 (Cont.)

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Access Road (Direct Effects)[f] | Outside SEZ (Indirect Effects)[g] | Overall Impact Magnitude[h] and Species-Specific Mitigation[i] |
|---|---|---|---|---|---|---|---|
| ***Mammals (Cont.)*** | | | | | | | |
| Silver-haired bat | *Lasionycteris noctivagans* | BLM-S | Uncommon year-round resident in desert habitats of southern Nevada. Forages in coniferous forests, foothill woodlands, and montane riparian habitats. May also forage in desert shrublands. Primarily roosts in hollow trees. About 4,050,000 acres of potentially suitable habitat occurs within the SEZ region. | 24,200 acres of potentially suitable habitat lost (0.6% of available potentially suitable habitat) | 53 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 115,000 acres of potentially suitable habitat (2.8% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effect. |
| Spotted bat | *Euderma maculatum* | BLM-S; NV-P; FWS-SC; NV-S2 | Year-round resident in forests and shrubland habitats. Uses caves and rock crevices for day roosting and winter hibernation. Nearest recorded occurrence is from the vicinity of Panaca, Nevada, approximately 13 mi east of the SEZ. About 3,952,400 acres of potentially suitable habitat occurs within the SEZ region. | 23,000 acres of potentially suitable habitat lost (0.6% of available potentially suitable habitat) | 15 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 103,350 acres of potentially suitable habitat (2.6% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effect. |

**TABLE 11.4.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Access Road (Direct Effects)[f] | Outside SEZ (Indirect Effects)[g] | Overall Impact Magnitude[h] and Species-Specific Mitigation[i] |
|---|---|---|---|---|---|---|---|
| ***Mammals (Cont.)*** | | | | | | | |
| Western pipistrelle | *Pipistrellus Hesperus* | BLM-S | A common year-round resident of deserts, grasslands, and woodlands in southern Nevada. Occurs in various habitats, including mountain foothill woodlands, desert shrublands, desert washes, and pinyon-juniper woodlands. Roosts primarily in rock crevices; occasionally in mines and caves. About 3,700,000 acres of potentially suitable habitat occurs within the SEZ region. | 25,050 acres of potentially suitable habitat lost (0.3% of available potentially suitable habitat) | 60 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 150,000 acres of potentially suitable habitat (4.1% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effect. |
| Western small-footed myotis | *Myotis ciliolabrum* | BLM-S; FWS-SC | Year-round resident in a variety of woodlands and riparian habitats at elevations below 9,000 ft. Roosts in caves, buildings, mines, and crevices of cliff faces. Known to occur in Lincoln County, Nevada. About 5,016,400 acres of potentially suitable habitat occurs within the SEZ region. | 25,000 acres of potentially suitable habitat lost (0.5% of available potentially suitable habitat) | 40 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 140,000 acres of potentially suitable habitat (2.8% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effect. |

**Footnotes on next page.**





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**TABLE 11.4.12.1-1 (Cont.)**

[a] The species presented in this table represent new species identified following publication of the Draft Solar PEIS or a re-evaluation of those species that were determined to have moderate or large impacts in the Draft Solar PEIS. The other special status species for this SEZ are identified in Table 11.4.12.1-1 of the Draft Solar PEIS.

[b] BLM-S = listed as sensitive by the BLM.

[c] Potentially suitable habitat was determined using SWReGAP habitat suitability models (USGS 2004, 2007). Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[d] Maximum area of potentially suitable habitat that could be affected relative to availability within the SEZ region. Habitat availability for each species within the region was determined by using SWReGAP habitat suitability models (USGS 2004, 2007). This approach probably overestimates the amount of suitable habitat in the project area.

[e] Direct effects within the SEZ consist of the ground-disturbing activities associated with construction and the maintenance of an altered environment associated with operations.

[f] For access road development, direct effects were estimated within a 5-mi (8-km) long, 60-ft (18-m) wide road ROW from the SEZ to the nearest state highway. Direct impacts within this area were determined from the proportion of potentially suitable habitat within the 1-mi (1.6-km) wide road corridor.

[g] Area of indirect effects was assumed to be the area adjacent to the SEZ within 5 mi (8 km) of the SEZ boundary where ground-disturbing activities would not occur. Indirect effects include effects from surface runoff, dust, noise, lighting, and so on from project developments. The potential degree of indirect effects would decrease with increasing distance away from the SEZ.

[h] Overall impact magnitude categories were based on professional judgment and are as follows: (1) *small*: ≤1% of the population or its habitat would be lost and the activity would not result in a measurable change in carrying capacity or population size in the affected area; (2) *moderate*: >1 but ≤10% of the population or its habitat would be lost and the activity would result in a measurable but moderate (not destabilizing) change in carrying capacity or population size in the affected area; (3) *large*: >10% of a population or its habitat would be lost and the activity would result in a large, measurable, and destabilizing change in carrying capacity or population size in the affected area. Note that much greater weight was given to the magnitude of direct effects because those effects would be difficult to mitigate. Design features would reduce most indirect effects to negligible levels.

[i] Species-specific mitigations are suggested here, but final mitigations should be developed in consultation with state and federal agencies and should be based on pre-disturbance surveys.

[j] Species in bold text have been recorded or have designated critical habitat in the affected area.

[k] To convert ft to m, multiply by 0.3048.

[l] To convert acres to $km^2$, multiply by 0.004047

[m] To convert mi to km, multiply by 1.6093.

sagebrush (*Artemisia* spp.). Nearest known occurrences are from Patterson Wash, approximately 12 mi (19 km) east of the SEZ. Potentially suitable habitat for this species occurs on the Dry Lake Valley North SEZ, assumed access road corridor, and other portions of the affected area (Table 11.4.12.1-1).

**Tiehm Blazingstar.** The Tiehm blazingstar is a perennial forb endemic to Nevada. This species was analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. It occurs on hilltops, sparsely vegetated white calcareous knolls, and bluffs with other scattered perennial plant species. Nearest recorded occurrences are from the White River, approximately 7 mi (11 km) west of the SEZ. Potentially suitable habitat for this species occurs on the Dry Lake Valley North SEZ, assumed access road corridor, and other portions of the affected area (Table 11.4.12.1-1).

**Golden Eagle.** The golden eagle is an uncommon to common permanent resident in southern Nevada. This species was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. The species inhabits rolling foothills, mountain areas, and desert shrublands. It nests on cliff faces and in large trees in open areas. Potentially suitable foraging habitat for this species may occur on the revised area of the SEZ and throughout the area of indirect effects (Table 11.4.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable nesting habitat (rocky cliffs and outcrops) does not occur on the SEZ or access road corridor; however, approximately 300 acres (1.2 km$^2$) of this habitat that may be potentially suitable nesting habitat occurs in the area of indirect effects.

**Gray Vireo.** The gray vireo is an uncommon summer resident in southern Nevada. This species was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. The species occurs in arid environments such as pinyon-juniper, chaparral, and desert shrublands. It builds open-cup nests of plant material in forked branches of shrubs or small trees. On the basis of an evaluation of the SWReGAP habitat suitability model for this species, potentially suitable habitat does not occur on the revised area of the SEZ or within the assumed access road corridor; however, potentially suitable breeding and nonbreeding habitat may occur outside the SEZ in the area of indirect effects (Table 11.4.12.1-1).

**Loggerhead Shrike.** The loggerhead shrike is a common winter resident in lowlands and foothills of southern Nevada. This species was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. The species occurs in open habitats with shrubs, trees, utility lines, or other perches. The highest densities of this species occur in open-canopied foothill forests. On the basis of an evaluation of the SWReGAP habitat suitability model for this species, potentially suitable winter foraging habitat may occur on the revised area of the SEZ, the assumed access road corridor, and the area of indirect effects (Table 11.4.12.1-1).

**Long-Eared Owl.** The long-eared owl is an uncommon year-round resident in southern Nevada. This species was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. The species inhabits desert shrubland environments in proximity to riparian areas such as desert washes. It nests in trees using old nests from other birds or squirrels. Potentially suitable foraging habitat for this species may occur on the revised area of the SEZ, assumed access road corridor, and the area of indirect effects (Table 11.4.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable nesting habitat (forests) does not occur on the revised area of the SEZ or assumed access road corridor (Table 11.4.12.1-1).

**Prairie Falcon.** The prairie falcon occurs throughout the western United States. This species was analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. According to the SWReGAP habitat suitability model for the prairie falcon, it is a year-round resident throughout the Dry Lake Valley North SEZ region. The species occurs in open habitats in mountainous areas, sagebrush-steppe, grasslands, or cultivated areas. Nests are typically constructed in well-sheltered ledges of rocky cliffs and outcrops. This species occurs in Lincoln County, Nevada, and potentially suitable foraging habitat occurs on the SEZ and in other portions of the affected area (Table 11.4.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable nesting habitat (rocky cliffs and outcrops) does not occur on the revised area of the SEZ or access road corridor; however, approximately 300 acres (1.2 km$^2$) of this habitat that may be potentially suitable nesting habitat occurs in the area of indirect effects.

**Western Burrowing Owl.** According to the SWReGAP habitat suitability model for the western burrowing owl, the species is a summer (breeding) resident of open, dry grasslands and desert habitats in the Dry Lake Valley North SEZ region. This species was analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. The species occurs locally in open areas with sparse vegetation, where it forages in grasslands, shrublands, and open disturbed areas and nests in burrows typically constructed by mammals. The species occurs in Lincoln County, Nevada, and potentially suitable summer breeding habitat is expected to occur in the SEZ and in other portions of the affected area (Table 11.4.12.1-1). Information provided by the Nevada BLM Ely District Office indicates that active nests are known to occur in burrows in the northern portion of the original SEZ configuration. Nest sites (burrows) are likely to occur on the revised area of the SEZ or within the area of indirect effects.

**Western Snowy Plover.** According to the SWReGAP habitat suitability model, the western snowy plover is a summer (breeding) resident throughout the Dry Lake Valley North SEZ region. This species was analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. This species breeds on alkali flats around reservoirs and sandy shorelines. The species is known to occur at Adams-McGill Reservoir, approximately 23 mi (37 km) northwest of the SEZ (Table 11.4.12.1-1). Suitable breeding habitat is expected to occur on the revised area of the SEZ and in portions of the affected area, particularly associated with the playa habitat along the southwestern border of the SEZ and in the area of indirect effects.

**Big Brown Bat.** The big brown bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. The big brown bat is uncommon in desert habitats but may occur in desert shrublands that are in close proximity to water sources. The species inhabits desert shrubland environments in proximity to riparian areas such as desert washes. It roosts in buildings, caves, mines, and trees. Potentially suitable foraging habitat for this species may occur in the revised area of the SEZ and throughout the area of indirect effects (Table 11.4.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur in the revised area of the SEZ or access road corridor; however, approximately 300 acres (1.2 km$^2$) of cliffs and rock outcrops that may be potentially suitable nesting habitat occurs in the area of indirect effects.

**California Myotis.** The California myotis is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. The species inhabits desert, chaparral, woodlands, and forests. It roosts primarily in crevices but also uses buildings, mines, and hollow trees. Potentially suitable foraging habitat for this species may occur in the revised area of the SEZ and throughout the area of indirect effects (Table 11.4.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur in the revised area of the SEZ or access road corridor; however, approximately 300 acres (1.2 km$^2$) of cliffs and rock outcrops that may be potentially suitable nesting habitat occurs in the area of indirect effects.

**Hoary Bat.** The hoary bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. The species inhabits woodlands, foothills, desert shrublands, and chaparral. It roosts primarily in trees. Potentially suitable foraging habitat for this species may occur in the revised area of the SEZ and throughout the area of indirect effects (Table 11.4.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests) does not occur in the revised area of the SEZ, the assumed access road corridor, or area of indirect effects (Table 11.4.12.1-1).

**Long-Legged Myotis.** The long-legged myotis is a common to uncommon year-round resident in southern Nevada. This species was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. This species is uncommon in desert and arid grassland environments and most common in woodlands above 4,000-ft (1,219-m) elevation. It forages in chaparral, scrub, woodlands, and desert shrublands and roosts in trees, caves, and crevices. Potentially suitable foraging habitat for this species may occur in the revised area of the SEZ and throughout the area of indirect effects (Table 11.4.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur in the revised area of the SEZ or access road corridor; however, approximately 300 acres (1.2 km$^2$) of cliffs and rock outcrops that may be potentially suitable nesting habitat occurs in the area of indirect effects.

**Western Pipistrelle.** The western pipistrelle is a common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. The species inhabits mountain foothill woodlands, desert shrublands, desert washes, and pinyon-juniper woodlands. It roosts primarily in rock crevices and occasionally in mines and caves. Potentially suitable foraging habitat for this species may occur in the revised area of the SEZ and throughout the area of indirect effects (Table 11.4.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (rock outcrops) does not occur in the revised area of SEZ or access road corridor; however, approximately 300 acres (1.2 km$^2$) of cliffs and rock outcrops that may be potentially suitable nesting habitat occurs in the area of indirect effects.

### 11.4.12.2 Impacts

Overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the special status species' habitat within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of the special status species' habitat would be lost; and (3) *large*: >10% of the special status species' habitat would be lost.

As presented in the Draft Solar PEIS, solar energy development within the Dry Lake Valley North SEZ could affect potentially suitable habitats of special status species. The analysis presented in the Draft Solar PEIS for the original Dry Lake Valley North SEZ developable area indicated that development would result in no impact or a small overall impact on most special status species (Table 11.4.12.1-1 in the Draft Solar PEIS). However, development was determined to result in moderate or large impacts on some special status species. Development within the revised area of the SEZ could still affect the same 22 species evaluated in the Draft Solar PEIS. However, the reduction in the SEZ boundaries and the developable area of the Dry Lake Valley North SEZ would result in reduced impact levels compared to original estimates in the Draft Solar PEIS. Those 13 species that were determined to have moderate or large impacts in the Draft Solar PEIS are discussed below. Impacts on species that were determined to have small overall impacts in the Draft Solar PEIS are not discussed, because impacts on these species using revised SEZ footprints are expected to remain small.

In addition, impacts on the 11 BLM-designated sensitive species that were not evaluated for the Dry Lake Valley North SEZ in the Draft Solar PEIS are discussed below and in Table 11.4.12.1-1. The impact assessment for these additional species was carried out in the same way as for those species analyzed in the Draft Solar PEIS (Section 11.4.12.2 of the Draft Solar PEIS).

**Blaine Fishhook Cactus.** The Blaine fishhook cactus is known to occur in the Dry Lake Valley. Approximately 132 acres (0.5 km$^2$) of potentially suitable habitat in the revised area of the Dry Lake Valley North SEZ could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents about 0.7% of potentially suitable habitat in the SEZ region. About 3,500 acres (14 km$^2$) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 17.4% of the potentially suitable habitat in the SEZ region (Table 11.4.12.1-1).

The overall impact on the Blaine fishhook cactus from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the SEZ region.

Avoiding or minimizing disturbance to all playa habitat in the revised area of the SEZ may be sufficient to reduce impacts on the Blaine fishhook cactus to small or negligible levels. For this species and other special status plants, impacts could be reduced by conducting pre-disturbance surveys and avoiding or minimizing disturbance to occupied habitats in the revised area of the SEZ. If avoidance or minimization is not a feasible option, plants could be translocated from areas of direct effects to protected areas that would not be affected directly or indirectly by future development. Alternatively or in combination with translocation, a compensatory plan could be developed and implemented to mitigate direct effects on occupied habitats. The plan could involve the protection and enhancement of existing occupied or suitable habitats to compensate for habitats lost to development. A comprehensive mitigation strategy that uses one or more of these options could be designed to completely offset the impacts of development.

**Eastwood Milkweed.** The Eastwood milkweed is known to occur in the Dry Lake Valley. Approximately 1,865 acres (7.5 $km^2$) of potentially suitable habitat in the revised area of the Dry Lake Valley North SEZ and 5 acres (<0.1 $km^2$) of potentially suitable habitat in the road corridor could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents about 0.5% of potentially suitable habitat in the SEZ region. About 27,800 acres (112 $km^2$) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 6.7% of the potentially suitable habitat in the SEZ region (Table 11.4.12.1-1).

The overall impact on the Eastwood milkweed from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the SEZ region.

Avoidance of all potentially suitable habitats is not a feasible way to mitigate impacts on the Eastwood milkweed, because potentially suitable sagebrush and mixed shrubland habitat is widespread throughout the area of direct effects. Impacts could be reduced by conducting pre-disturbance surveys and avoiding or minimizing disturbance to occupied habitats on the SEZ. If avoidance or minimization is not a feasible option, plants could be translocated from areas of direct effects to protected areas that would not be affected directly or indirectly by future development. Alternatively or in combination with translocation, a compensatory plan could be developed and implemented to mitigate direct effects on occupied habitats. The plan could involve the protection and enhancement of existing occupied or suitable habitats to compensate for habitats lost to development. A comprehensive mitigation strategy that uses one or more of these options could be designed to completely offset the impacts of development.

**Long-Calyx Milkvetch.** The long-calyx milkvetch is not known to occur in the affected area of the revised area of the Dry Lake Valley North SEZ; however, approximately 18,000 acres (73 km$^2$) of potentially suitable habitat in the revised area of the SEZ and 40 acres (0.2 km$^2$) of potentially suitable habitat in the road corridor could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents about 0.4% of potentially suitable habitat in the SEZ region. About 124,000 acres (502 km$^2$) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 2.9% of the potentially suitable habitat in the SEZ region (Table 11.4.12.1-1).

The overall impact on the long-calyx milkvetch from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the SEZ region.

Avoidance of all potentially suitable habitats to mitigate impacts on the long-calyx milkvetch is not feasible, because potentially suitable shrubland habitat is widespread throughout the area of direct effects. However, impacts could be reduced with the implementation of programmatic design features and the mitigation options described previously for the Eastwood milkweed. The need for mitigation, other than programmatic design features, should be determined by conducting pre-disturbance surveys for the species and its habitat on the SEZ.

**Needle Mountains Milkvetch.** The Needle Mountains milkvetch is not known to occur in the affected area of the revised area of the Dry Lake Valley North SEZ; however, approximately 500 acres (2 km$^2$) of potentially suitable habitat in the revised area of the SEZ could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents about 1.2% of potentially suitable habitat in the SEZ region. About 7,250 acres (29 km$^2$) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 17.2% of the potentially suitable habitat in the SEZ region (Table 11.4.12.1-1).

The overall impact on the Needle Mountains milkvetch from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the SEZ region.

Avoiding or minimizing disturbance to playa and arid grassland habitats on the revised area of the SEZ may be sufficient to reduce impacts on the Needle Mountains milkvetch to small or negligible levels. In addition, impacts could be reduced with the implementation of programmatic design features and the mitigation options described previously for the Eastwood milkweed. The need for mitigation, other than programmatic design features, should be determined by conducting pre-disturbance surveys for the species and its habitat on the SEZ.

**Pioche Blazingstar.** The Pioche blazingstar is not known to occur in the affected area of the revised area of the Dry Lake Valley North SEZ; however, approximately 20,000 acres (81 $km^2$) of potentially suitable habitat on the SEZ and 46 acres (0.2 $km^2$) of potentially suitable habitat in the road corridor could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents about 0.7% of potentially suitable habitat in the SEZ region. About 146,250 acres (592 $km^2$) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 5.1% of the potentially suitable habitat in the SEZ region (Table 11.4.12.1-1).

The overall impact on the Pioche blazingstar from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the revised area of the SEZ region.

Avoidance of all potentially suitable habitats to mitigate impacts on the Pioche blazingstar is not feasible, because potentially suitable shrubland habitat is widespread throughout the area of direct effects. However, impacts could be reduced with the implementation of programmatic design features and the mitigation options described previously for the Eastwood milkweed. The need for mitigation, other than programmatic design features, should be determined by conducting pre-disturbance surveys for the species and its habitat on the SEZ.

**Tiehm Blazingstar.** The Tiehm blazingstar is not known to occur in the affected area of the revised area of the Dry Lake Valley North SEZ; however, approximately 20,000 acres (81 $km^2$) of potentially suitable habitat in the SEZ and 40 acres (0.2 $km^2$) of potentially suitable habitat in the road corridor could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents about 0.9% of potentially suitable habitat in the SEZ region. About 120,000 acres (486 $km^2$) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 5.2% of the potentially suitable habitat in the SEZ region (Table 11.4.12.1-1).

The overall impact on the Tiehm blazingstar from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the SEZ region.

Avoidance of all potentially suitable habitats to mitigate impacts on the Tiehm blazingstar is not feasible, because potentially suitable shrubland habitat is widespread throughout the area of direct effects. However, impacts could be reduced with the implementation of programmatic design features and the mitigation options described previously for the Eastwood milkweed. The need for mitigation, other than programmatic design features, should be determined by conducting pre-disturbance surveys for the species and its habitat on the SEZ.

**Golden Eagle.** The golden eagle was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. This species is an uncommon to common permanent resident in southern Nevada, and potentially suitable foraging habitat is expected to occur in the affected area of the revised area of the Dry Lake Valley North SEZ. Approximately 24,890 acres (100 $km^2$) of potentially suitable foraging habitat in the revised area of the SEZ and 60 acres (0.2 $km^2$) of potentially suitable foraging habitat in the access road corridor could be directly affected by construction and operations (Table 11.4.12.1-1). This direct impact area represents 0.5% of potentially suitable habitat in the SEZ region. About 143,800 acres (582 $km^2$) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 2.9% of the available suitable habitat in the SEZ region (Table 11.4.12.1-1). Most of this area could serve as foraging habitat (open shrublands). On the basis of an evaluation of SWReGAP land cover types, potentially suitable nesting habitat (rocky cliffs and outcrops) does not occur on the SEZ or access road corridor; however, approximately 300 acres (1.2 $km^2$) of this habitat that may be potentially suitable nesting habitat occurs in the area of indirect effects.

The overall impact on the golden eagle from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered small, because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents less than 1% of potentially suitable foraging habitat in the SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of direct impacts on all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the golden eagle, because potentially suitable shrubland is widespread throughout the area of direct effects and readily available in other portions of the affected area.

**Gray Vireo.** The gray vireo was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. This species is an uncommon summer resident in southern Nevada. The gray vireo is not known to occur in the revised area of the Dry Lake Valley North SEZ, and suitable habitat is not expected to occur within the SEZ or access road corridor; however, on the basis of an evaluation of the SWReGAP habitat suitability model for this species, approximately 3,150 acres (13 $km^2$) of potentially suitable breeding and nonbreeding habitat may occur outside the SEZ in the area of indirect effects. This area represents about 0.2% of the potentially suitable foraging habitat in the SEZ region (Table 11.4.12.1-1).

The overall impact on the gray vireo from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered small, because no potentially suitable habitat for this species occurs in the area of direct effects and only indirect effects are possible. The implementation of programmatic design features may be sufficient to reduce indirect impacts on this species to negligible levels.

**Loggerhead Shrike.** The loggerhead shrike was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. This species is a common winter resident in lowlands and foothills of southern Nevada. Approximately 24,900 acres (100 km$^2$) of potentially suitable foraging habitat in the revised area of the SEZ and 60 acres (0.2 km$^2$) of potentially suitable foraging habitat in the access road corridor could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents 0.5% of potentially suitable habitat in the SEZ region. About 140,000 acres (567 km$^2$) of potentially suitable winter foraging habitat occurs in the area of indirect effects; this area represents about 2.8% of the available suitable habitat in the SEZ region (Table 11.4.12.1-1).

The overall impact on the loggerhead shrike from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered small, because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents less than 1% of potentially suitable foraging habitat in the SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of direct impacts on all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the loggerhead shrike, because potentially suitable shrubland is widespread throughout the area of direct effects and readily available in other portions of the affected area.

**Long-Eared Owl.** The long-eared owl was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. This species is an uncommon to common permanent resident in southern Nevada, and potentially suitable foraging habitat is expected to occur in the affected area of the revised area of the Dry Lake Valley North SEZ. Approximately 24,890 acres (101 km$^2$) of potentially suitable foraging habitat in the revised area of the SEZ and 60 acres (0.2 km$^2$) of potentially suitable foraging habitat in the access road corridor could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents 0.5% of potentially suitable habitat in the SEZ region. About 149,450 acres (605 km$^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 3.1% of the available suitable foraging habitat in the SEZ region (Table 11.4.12.1-1).

The overall impact on the long-eared owl from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered small, because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents less than 1% of potentially suitable foraging habitat in the SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of direct impacts on all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the long-eared owl, because potentially suitable shrubland is widespread throughout the area of direct effects and readily available in other portions of the affected area.

**Prairie Falcon.** The prairie falcon is a year-round resident in the Dry Lake Valley North SEZ region, and potentially suitable foraging habitat is expected to occur in the affected area of the revised area of the SEZ. Approximately 24,000 acres (97 km$^2$) of potentially suitable habitat within the SEZ and 30 acres (0.1 km$^2$) of potentially suitable habitat in the road corridor could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents 1.4% of potentially suitable habitat in the SEZ region. About 140,000 acres (567 km$^2$) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 8.2% of the potentially suitable habitat in the SEZ region (Table 11.4.12.1-1). Most of this area could serve as foraging habitat (open shrublands). On the basis of an evaluation of SWReGAP land cover types, potentially suitable nesting habitat (rocky cliffs and outcrops) does not occur on the SEZ or access road corridor; however, approximately 300 acres (1.2 km$^2$) of this habitat that may be potentially suitable nesting habitat occurs in the area of indirect effects.

The overall impact on the prairie falcon from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered moderate, because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents greater than or equal to 1% but less than 10% of potentially suitable foraging habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species. Avoidance of all potentially suitable foraging habitats to mitigate impacts on the prairie falcon is not feasible, because potentially suitable shrubland habitat is widespread throughout the area of direct effects and in other portions of the SEZ region.

**Western Burrowing Owl.** The western burrowing owl is considered a summer breeding resident within the revised area of the Dry Lake Valley North SEZ region, and potentially suitable foraging habitat is expected to occur in the affected area. Approximately 24,600 acres (100 km$^2$) of potentially suitable habitat in the revised area of the SEZ and 50 acres (0.2 km$^2$) of potentially suitable habitat in the road corridor could be directly affected by construction and operations (Table 1.4.12.1-1). This direct effects area represents 0.8% of potentially suitable habitat in the SEZ region. About 145,000 acres (587 km$^2$) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 4.6% of the potentially suitable habitat in the SEZ region (Table 11.4.12.1-1). Most of this area could serve as foraging and nesting habitat (shrublands). Information provided by the Nevada BLM Ely District Office indicates that active nests are known to occur in burrows in the northern portion of the original SEZ configuration. Nest sites (burrows) are likely to occur in the revised area of the SEZ or within the area of indirect effects.

The overall impact on the western burrowing owl from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered small, because the amount of potentially suitable foraging and nesting habitat for this species in the area of direct effects represents less than 1% of potentially suitable foraging and nesting habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species.

Avoidance of all potentially suitable habitats is not a feasible way to mitigate impacts on the western burrowing owl, because potentially suitable shrubland habitats are widespread throughout the area of direct effects and readily available in other portions of the SEZ region. Impacts on the western burrowing owl could be reduced by implementing programmatic design features, conducting pre-disturbance surveys, and avoiding or minimizing disturbance to occupied burrows on the SEZ. If avoidance or minimization is not a feasible option, a compensatory plan could be developed and implemented to mitigate direct effects. The plan could involve the protection and enhancement of existing occupied or suitable habitats to compensate for habitats lost to development. A comprehensive mitigation strategy that uses one or both of these options could be designed to completely offset the impacts of development. The need for mitigation, other than programmatic design features, should be determined by conducting pre-disturbance surveys for the species and its habitat on the SEZ.

**Western Snowy Plover.** The western snowy plover is considered a summer breeding resident within the Dry Lake Valley North SEZ region, and potentially suitable foraging habitat is expected to occur in the affected area. Approximately 250 acres (1 $km^2$) of potentially suitable habitat in the revised area of the SEZ could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents 0.4% of potentially suitable habitat in the SEZ region. About 5,000 acres (20 $km^2$) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 7.5% of the potentially suitable habitat in the SEZ region (Table 11.4.12.1-1). Most of this area could serve as foraging and nesting habitat in and along playa margins. On the basis of an evaluation of SWReGAP land cover types, approximately 165 acres (1 $km^2$) of playa habitat exists on the SEZ that may be potentially suitable nesting or foraging habitat for this species.

The overall impact on the western snowy plover from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered small, because the amount of potentially suitable foraging and nesting habitat for this species in the area of direct effects represents less than 1% of potentially suitable foraging and nesting habitat in the region.

Impacts on the western snowy plover could be reduced by implementing programmatic design features, conducting pre-disturbance surveys, and avoiding or minimizing disturbance to all playa habitats and other occupied habitats in the revised area of the SEZ. If avoidance or minimization of playas and all occupied habitats is not a feasible option, a compensatory plan could be developed and implemented to mitigate direct effects. The plan could involve the protection and enhancement of existing occupied or suitable habitats to compensate for habitats lost to development. A comprehensive mitigation strategy that uses one or both of these options could be designed to completely offset the impacts of development. The need for mitigation, other than programmatic design features, should be determined by conducting pre-disturbance surveys for the species and its habitat on the SEZ.

**Big Brown Bat.** The big brown bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. Suitable roosting habitats (caves, forests, and buildings) are not expected to occur in the revised area of the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 24,840 acres (101 $km^2$) and 50 acres (0.2 $km^2$) of potentially suitable foraging habitat within the revised area of the SEZ and access road corridor, respectively, could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents about 0.9% of potentially suitable foraging habitat in the region. About 89,200 acres (361 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 3.3% of the available suitable foraging habitat in the region (Table 11.4.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (rocky cliffs and outcrops) does not occur on the SEZ or access road corridor; however, approximately 300 acres (1.2 $km^2$) of this habitat that may be potentially suitable roosting habitat occurs in the area of indirect effects.

The overall impact on the big brown bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the big brown bat, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

**Brazilian Free-Tailed Bat.** The Brazilian free-tailed bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. Suitable roosting habitats (caves, forests, and buildings) are not expected to occur on the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 25,050 acres (101 $km^2$) and 53 acres (0.2 $km^2$) of potentially suitable foraging habitat in the revised area of the SEZ and access road corridor, respectively, could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents about 0.6% of potentially suitable foraging habitat in the region. About 120,000 acres (485 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.9% of the available suitable foraging habitat in the region (Table 11.4.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (rocky cliffs and outcrops) does not occur in the revised area of the SEZ or access road corridor; however, approximately 300 acres (1.2 $km^2$) of this habitat that may be potentially suitable roosting habitat occurs in the area of indirect effects.

The overall impact on the Brazilian free-tailed bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Dry Lake Valley North SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the Brazilian free-tailed bat, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

**California Myotis.** The California myotis is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests and rock outcrops) are not expected to occur in the revised area of the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 25,050 acres (101 $km^2$) and 53 acres (0.2 $km^2$) of potentially suitable foraging habitat on the revised area of the SEZ and access road corridor, respectively, could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents about 1.0% of potentially suitable foraging habitat in the region. About 117,000 acres (473 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 4.6% of the available suitable foraging habitat in the region (Table 11.4.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (rocky cliffs and outcrops) does not occur on the SEZ or access road corridor; however, approximately 300 acres (1.2 $km^2$) of this habitat that may be potentially suitable roosting habitat occurs in the area of indirect effects.

The overall impact on the California myotis from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered moderate, because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents greater than or equal to 1% but less than 10% of potentially suitable habitat in the SEZ region. The implementation of programmatic design features may be sufficient to reduce indirect impacts on this species. However, avoidance of all potentially suitable foraging habitats to mitigate impacts on the California myotis is not feasible, because potentially suitable shrubland habitat is widespread throughout the area of direct effect.

**Desert Valley Kangaroo Mouse.** The Desert Valley kangaroo mouse is endemic to Nevada and is known to occur in the revised area of the Dry Lake Valley North SEZ. This species was analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. Approximately 24,000 acres (97 $km^2$) and 17 acres (0.1 $km^2$) of potentially suitable habitat in the revised area of the SEZ and, access road corridor, respectively, could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents 1.9% of potentially suitable habitat in the SEZ region. About 60,000 acres (243 $km^2$) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 4.8% of the potentially suitable habitat in the SEZ region (Table 11.4.12.1-1).

The overall impact on the Desert Valley kangaroo mouse from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered moderate, because the amount of potentially suitable habitat for this species in the area of direct effects represents greater than or equal to 1% but less than 10% of potentially suitable habitat in the SEZ region. The implementation of programmatic design features may be sufficient to reduce indirect impacts on this species to negligible levels.

Despite the apparent widespread availability of potentially suitable habitat in the affected area, the complete avoidance of all playa habitats in the revised area of the SEZ could reduce impacts on this species. Consistent with the mitigation recommendations provided by the

USFWS (Stout 2009), pre-disturbance surveys and avoiding or minimizing disturbance to occupied habitats in the area of direct effects could reduce impacts. If avoidance or minimization is not a feasible option, a compensatory plan could be developed and implemented to mitigate direct effects on occupied habitats. The plan could involve the protection and enhancement of existing occupied or suitable habitats to compensate for habitats lost to development. A comprehensive mitigation strategy that uses one or both of these options could be designed to completely offset the impacts of development.

**Fringed Myotis.** The fringed myotis is a year-round resident within the Dry Lake Valley North SEZ region. Suitable roosting habitats (caves and buildings) are not expected to occur on the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. This species was analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. Approximately 410 acres (2 $km^2$) and 10 acres (<1 $km^2$) of potentially suitable habitat in the revised area of the SEZ and access road corridor, respectively, could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents about 0.1% of potentially suitable foraging habitat in the region. About 80,000 acres (324 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.7% of the available suitable foraging habitat in the region (Table 11.4.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (rocky cliffs and outcrops) does not occur on the SEZ or access road corridor; however, approximately 300 acres (1.2 $km^2$) of this potentially suitable roosting habitat occurs in the area of indirect effects.

The overall impact on the fringed myotis from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered small, because the amount of potentially suitable foraging and nesting habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the SEZ region. The implementation of programmatic design features may be sufficient to reduce indirect impacts on this species. However, avoidance of all potentially suitable foraging habitats to mitigate impacts on the fringed myotis is not feasible, because potentially suitable shrubland habitat is widespread throughout the area of direct effects.

**Hoary Bat.** The hoary bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests) are not expected to occur in the revised area of the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 24,000 acres (97 $km^2$) and 45 acres (0.2 $km^2$) of potentially suitable habitat in the revised area of the SEZ and access road corridor, respectively, could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents about 1.1% of potentially suitable foraging habitat in the region. About 65,000 acres (263 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 3.1% of the available suitable foraging habitat in the region (Table 11.4.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable roosting habitat (forests) exists within the revised area of the SEZ, access road corridor, or the area of indirect effects.

The overall impact on the hoary bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered moderate, because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents greater than or equal to 1% but less than 10% of potentially suitable habitat in the SEZ region. The implementation of programmatic design features may be sufficient to reduce indirect impacts on this species. However, avoidance of all potentially suitable foraging habitats to mitigate impacts on the hoary bat is not feasible, because potentially suitable shrubland habitat is widespread throughout the area of direct effect.

**Long-Legged Myotis.** The long-legged myotis is a common to uncommon year-round resident in southern Nevada. This species was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests and rock outcrops) are not expected to occur in the revised area of the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 24,850 acres (100 $km^2$) and 51 acres (0.2 $km^2$) of potentially suitable habitat in the revised area of the SEZ and access road corridor, respectively, could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents about 0.9% of potentially suitable foraging habitat in the region. About 90,000 acres (364 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 3.3% of the available suitable foraging habitat in the region (Table 11.4.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (rocky cliffs and outcrops) does not occur on the SEZ or access road corridor; however, approximately 300 acres (1.2 $km^2$) of this potentially suitable roosting habitat occurs in the area of indirect effects.

The overall impact on the long-legged myotis from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the long-legged myotis, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

**Pahranagat Valley Montane Vole.** The Pahranagat Valley montane vole is endemic to Lincoln County, Nevada, near the Pahranagat Creek. This species was analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. The species is not known to occur in the affected area of the revised area of the Dry Lake Valley North SEZ; however, approximately 410 acres (2 $km^2$) of potentially suitable habitat on the SEZ could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents 1.7% of potentially suitable habitat in the SEZ region. About 6,850 acres (28 $km^2$) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 28.6% of the potentially suitable habitat in the SEZ region (Table 11.4.12.1-1).

The overall impact on the Pahranagat Valley montane vole from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered moderate, because the amount of potentially suitable foraging and nesting habitat for this species in the area of direct effects represents greater than or equal to 1% but less than 10% of potentially suitable habitat in the SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels.

Avoiding or minimizing disturbance to all mesic habitats in the revised area of the SEZ (e.g., playas) could reduce impacts on this species. In addition, pre-disturbance surveys and avoidance or minimization of disturbance to occupied habitats in the area of direct effects could reduce impacts. If avoidance or minimization is not a feasible option, a compensatory plan could be developed and implemented to mitigate direct effects on occupied habitats. The plan could involve the protection and enhancement of existing occupied or suitable habitats to compensate for habitats lost to development. A comprehensive mitigation strategy that uses one or both of these options could be designed to completely offset the impacts of development.

**Silver-Haired Bat.** The silver-haired bat is an uncommon year-round resident in southern Nevada. This species was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests) are not expected to occur on the SEZ or access road corridor, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 24,200 acres (28 $km^2$) and 53 acres (0.2 $km^2$) of potentially suitable foraging habitat on the revised SEZ and access road corridor, respectively, could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents about 0.6% of potentially suitable foraging habitat in the region. About 115,000 acres (465 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.8% of the available suitable foraging habitat in the region (Table 11.4.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable roosting habitat (forests) exists within the SEZ, access road corridor, or the area of indirect effects.

The overall impact on the silver-haired bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Dry Lake Valley North SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the silver-haired bat, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

**Spotted Bat.** The spotted bat is a year-round resident within the Dry Lake Valley North SEZ region. This species was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. Suitable roosting habitats (caves and rock outcrops) are not expected to occur on the SEZ or access road corridor, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 23,000 acres (93 km$^2$) of potentially suitable foraging habitat on the SEZ and 15 acres (0.1 km$^2$) of potentially suitable habitat in the access road corridor could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents about 0.6% of potentially suitable foraging habitat in the region. About 103,350 acres (418 km$^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.6% of the potentially suitable foraging habitat in the region (Table 11.4.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (rocky cliffs and outcrops) does not occur on the SEZ or access road corridor; however, approximately 300 acres (1.2 km$^2$) of this potentially suitable roosting habitat occurs in the area of indirect effects.

The overall impact on the spotted bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered small, because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features may be sufficient to reduce indirect impacts on this species. Avoidance of all potentially suitable foraging habitats to mitigate impacts on the spotted bat is not feasible, because potentially suitable shrubland habitat is widespread throughout the area of direct effects and in other portions of the SEZ region.

**Western Pipistrelle**. The western pipistrelle is a common year-round resident in southern Nevada. This species was not analyzed for the Dry Lake Valley North SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests and rock outcrops) are not expected to occur in the revised area of the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 25,050 acres (101 km$^2$) and 60 acres (0.2 km$^2$) of potentially suitable foraging habitat on the revised SEZ and access road corridor, respectively, could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents about 0.3% of potentially suitable foraging habitat in the region. About 150,000 acres (607 km$^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 4.1% of the available suitable foraging habitat in the region (Table 11.4.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (rocky cliffs and outcrops) does not occur on the SEZ or access road corridor; however, approximately 300 acres (1.2 km$^2$) of this potentially suitable roosting habitat occurs in the area of indirect effects.

The overall impact on the western pipistrelle from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the western pipistrelle, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

**Western Small-Footed Bat.** The western small-footed bat is a year-round resident within the Dry Lake Valley North SEZ region. Suitable roosting habitats (caves, rock outcrops, and buildings) are not expected to occur in the revised area of the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 25,000 acres (101 $km^2$) and 40 acres (0.2 $km^2$) of potentially suitable foraging habitat on the revised SEZ and access road corridor, respectively, could be directly affected by construction and operations (Table 11.4.12.1-1). This direct effects area represents about 0.5% of potentially suitable foraging habitat in the region. About 140,000 acres (567 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.8% of the potentially suitable foraging habitat in the region (Table 11.4.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (rocky cliffs and outcrops) does not occur on the SEZ or access road corridor; however, approximately 300 acres (1.2 $km^2$) of this potentially suitable roosting habitat occurs in the area of indirect effects.

The overall impact on the western small-footed bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Dry Lake Valley North SEZ is considered small, because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features may be sufficient to reduce indirect impacts on this species. However, avoidance of all potentially suitable foraging habitats to mitigate impacts on the western small-footed bat is not feasible, because potentially suitable shrubland habitat is widespread throughout the area of direct effects and in other portions of the SEZ region.

#### 11.4.12.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on special status and rare species are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific resources and conditions will guide how programmatic design features are applied, for example:

- Pre-disturbance surveys shall be conducted within the SEZ and access road corridor (i.e., area of direct effects) to determine the presence and abundance of special status species, including those identified in Table 11.4.12.1-1; disturbance to occupied habitats for these species shall be avoided or minimized to the extent practicable. If avoiding or minimizing impacts on occupied habitats is not possible, translocation of individuals from areas of direct effects or compensatory mitigation of direct effects on occupied habitats may be used to reduce impacts. A comprehensive mitigation strategy for special status species that uses one or more of these options to offset the impacts of development shall be developed in coordination with the appropriate federal and state agencies.

- Avoiding or minimizing disturbance of playa habitat on the SEZ shall be used to reduce or eliminate impacts on the Blaine fishhook cactus, Needle

Mountains milkvetch, western snowy plover, Desert Valley kangaroo mouse, and Pahranagat Valley montane vole.

- Consultation with the USFWS shall be conducted to address the potential for impacts (primarily indirect impacts) on the desert tortoise, a species listed as threatened under the ESA. Consultation will identify an appropriate survey protocol, avoidance and minimization measures, and, if appropriate, reasonable and prudent alternatives, reasonable and prudent measures, and terms and conditions for incidental take statements.

It is anticipated that implementation of these programmatic design features will reduce the majority of impacts on the special status species from habitat disturbance and groundwater use.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for special status species have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis. Projects will comply with terms and conditions set forth by the USFWS Biological Opinion resulting from the programmatic consultations and any necessary project-specific ESA Section 7 consultations.

## 11.4.13 Air Quality and Climate

### 11.4.13.1 Affected Environment

Except as noted below, the information for air quality and climate presented in the affected environment section of the Draft Solar PEIS remains essentially unchanged.

#### *11.4.13.1.1 Existing Air Emissions*

The Draft Solar PEIS presented Lincoln County emissions data for 2002. More recent data for 2008 (EPA 2011a) were reviewed for this Final Solar PEIS. The two emissions inventories used different sources and assumptions. For example, the 2008 data did not include biogenic emissions and emissions from fires. In the more recent data, all emissions were lower. These changes would not affect the modeled air quality impacts presented in this update.

#### *11.4.13.1.2 Air Quality*

The calendar quarterly average NAAQS of 1.5 $\mu g/m^3$ for lead presented in Table 11.4.13.1-2 of the Draft Solar PEIS has been replaced by the rolling 3-month standard (0.15 $\mu g/m^3$). The federal 24-hour and annual $SO_2$, 1-hour $O_3$, and annual $PM_{10}$ standards have been revoked as well (EPA 2011b). These changes do not affect the modeled air quality impacts presented in this update. Nevada State Ambient Air Quality Standards (SAAQS) have not been changed.

### 11.4.13.2 Impacts

#### *11.4.13.2.1 Construction*

**Methods and Assumptions**

Except for the area disturbed at any one time during construction, the methods and modeling assumptions have not changed substantially from those presented in the Draft Solar PEIS. On the basis of the reduced size of the SEZ, air quality impacts for this Final Solar PEIS were remodeled assuming that two project areas of 3,000 acres (12.14 $km^2$) each and 6,000 acres (24.28 $km^2$) in total, located in the southern portion of the SEZ close to nearby residences, could be disturbed at the same time. The Draft Solar PEIS had assumed that three such project areas of 3,000 acres (12.14 $km^2$) each and 9,000 acres (36.42 $km^2$) in total could be disturbed at the same time.

In the Draft Solar PEIS, concentrations at human receptors were estimated indirectly from contours based on modeled concentrations at gridded receptor locations. In this Final Solar PEIS, concentrations were estimated directly at those receptors.

**Results**

Potential particulate impacts on air quality from construction were remodeled based on the updated boundaries of the proposed Dry Lake Valley North SEZ.[2] Changes in magnitude to predicted impacts at the boundary would be expected to be larger than changes at greater distances from the SEZ. Table 11.4.13.2-1 presents the updated maximum modeled concentrations from construction fugitive dust.

Except for 24-hour $PM_{2.5}$, overall concentration estimates are less than those predicted in the Draft Solar PEIS, as would be expected given the reduction in the area assumed to be disturbed. The removal of the northern portion and the eastern panhandle of the proposed SEZ from consideration in this update required rearrangement of source areas for modeling. This

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2 At this programmatic level, detailed information on construction activities, such as facility size, type of solar technology, heavy equipment fleet, activity level, work schedule, and so forth, is not known; thus air quality modeling cannot be conducted. It has been assumed that an area of 6,000 acres (24.28 $km^2$) in total would be disturbed continuously, and thus the modeling results and discussion here should be interpreted in that context. During the site-specific project phase, more detailed information would be available and more realistic air quality modeling analysis could be conducted. It is likely that impacts on ambient air quality predicted for specific projects would be much lower than those in this Final Solar PEIS.

**TABLE 11.4.13.2-1 Maximum Air Quality Impacts from Emissions Associated with Construction Activities for the Proposed Dry Lake Valley North SEZ as Revised**

| | | | Concentration (μg/m$^3$) | | | | Percentage of NAAQS/SAAQS | |
|---|---|---|---|---|---|---|---|---|
| Pollutant[a] | Averaging Time | Rank[b] | Maximum Increment[b] | Background[c] | Total | NAAQS/ SAAQS | Increment | Total |
| $PM_{10}$ | 24 hours | H6H | 347 | 97.0 | 444 | 150 | 232 | 296 |
| | Annual | –[d] | 57.4 | 22.0 | 79.4 | 50 | 115 | 159 |
| $PM_{2.5}$ | 24 hours | H8H | 24.8 | 10.2 | 35.0 | 35 | 71 | 100 |
| | Annual | – | 5.7 | 4.1 | 9.8 | 15 | 38 | 65 |

[a] $PM_{2.5}$ = particulate matter with a diameter of ≤2.5 μm; $PM_{10}$ = particulate matter with a diameter of ≤10 μm.

[b] Concentrations for attainment demonstration are presented. H6H = highest of the sixth-highest concentrations at each receptor over the 5-year period. H8H = highest of the multiyear average of the eighth-highest concentrations at each receptor over the 5-year period. For the annual average, multiyear averages of annual means over the 5-year period are presented. Maximum concentrations are predicted to occur at the site boundaries.

[c] See Table 11.4.13.1-2 of the Draft Solar PEIS.

[d] A dash indicates not applicable.

rearrangement probably accounts for the small increase in the levels of 24-hour $PM_{2.5}$ predicted for this Final Solar PEIS. Despite this increase, the updated predictions are still consistent with the conclusion in the Draft Solar PEIS that maximum $PM_{10}$ levels in the vicinity of the SEZ could exceed standard levels used for comparison during construction of solar facilities. These high $PM_{10}$ concentrations would be limited to the immediate areas surrounding the SEZ boundaries and would decrease quickly with distance.

The reduction in the area assumed to be disturbed for the proposed Dry Lake Valley North SEZ meant that the nearest towns analyzed for this Final Solar PEIS were different than the nearest towns analyzed for the Draft Solar PEIS. With one exception, this analysis predicted smaller concentrations at nearby human receptor locations than were predicted in the Draft Solar PEIS. Even with this one exception, the conclusions presented in the Draft Solar PEIS remain valid.

Updated 24-hour and annual $PM_{10}$ concentration increments at both the surrogate receptors[3] for the nearest Class I Area (Zion NP in Utah) and at the National Park itself are lower than those presented in the Draft Solar PEIS. The conclusion in the Draft Solar PEIS that the $PM_{10}$ PSD Class I increments would not be exceeded remains valid.

[3] Because the nearest Class I area is more than 31 mi (50 km) from the SEZ (which exceeds the maximum modeling distance), several regularly spaced receptors in the direction of the nearest Class I area were selected as surrogates for the PSD analysis.

As stated in the Draft Solar PEIS, predicted 24-hour and annual $PM_{10}$ concentration levels could exceed the standard levels at the SEZ boundaries and in the immediate surrounding areas during the construction of solar facilities. To reduce potential impacts on ambient air quality and in compliance with programmatic design features, aggressive dust control measures would be used. Potential air quality impacts on nearby communities would be much lower. Modeling indicates that emissions from construction activities are not anticipated to exceed Class I PSD $PM_{10}$ increments at the nearest federal Class I area (Zion NP in Utah). Construction activities are not subject to the PSD program, and the comparison provides only a screen for gauging the size of the impact. Accordingly, it is anticipated that impacts of construction activities on ambient air quality would be moderate and temporary.

Considering the reduced size of the SEZ, emissions from construction equipment and vehicles would be less that those estimated in the Draft Solar PEIS. Any potential impacts on AQRVs at nearby federal Class I areas would be less. Thus, as concluded in the Draft, emissions from construction-related equipment and vehicles are temporary and would cause some unavoidable but short-term impacts.

#### *11.4.13.2.2 Operations*

The reduction in the developable area of the proposed Dry Lake Valley North SEZ by about 67% decreases the generation capacity and annual power generation by a similar percentage and thus decreases the potentially avoided emissions presented in the Draft Solar PEIS. Table 11.4.13.2-2 in the Draft Solar PEIS provided estimates for emissions potentially avoided by a solar facility. These estimates were updated by reducing the tabulated emissions by about 67%, as shown in the revised Table 11.4.13.2-2. For example, depending on the technology used, up to 4,725 tons of $NO_x$ per year (= 32.61% × the low-end value of 14.488 tons per year tabulated in the Draft Solar PEIS) could be avoided by full solar development of the revised area of the proposed Dry Lake Valley North SEZ. Although the total emissions avoided by full solar development of the proposed Dry Lake Valley North SEZ are considerably reduced from those presented in the Draft Solar PEIS, the conclusions of the Draft Solar PEIS remain valid; that is, if the proposed Dry Lake Valley North SEZ were fully developed, the emissions avoided could be substantial. Power generation from fossil fuel–fired power plants accounts for about 93% of the total electric power generated in Nevada, of which the contributions from natural gas and coal combustion are comparable (EPA 2009a). Thus, solar facilities to be built in the Dry Lake Valley North SEZ could avoid relatively more fossil fuel emissions than those built in other states that rely less on fossil fuel–generated power.

#### *11.4.13.2.3 Decommissioning and Reclamation*

The discussion in the Draft Solar PEIS remains valid. Decommissioning and reclamation activities would be of short duration and their potential impacts would be moderate and temporary.

**TABLE 11.4.13.2-2 Annual Emissions from Combustion-Related Power Generation Avoided by Full Solar Development of the Proposed Dry Lake Valley North SEZ as Revised**

| Area Size (acres) | Capacity (MW)[a] | Power Generation (GWh/yr)[b] | Emissions Displaced (tons/yr; $10^3$ tons/yr for $CO_2$)[c] | | | |
|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_x$ | Hg | $CO_2$ |
| 25,069 | 2,228–4,011 | 3,904–7,027 | 5,508–9,915 | 4,725–8,504 | 0.031–0.057 | 3,032–5,458 |
| Percentage of total emissions from electric power systems in the state of Nevada[d] | | | 10–19% | 10–19% | 10–19% | 10–19% |
| Percentage of total emissions from all source categories in the state of Nevada[e] | | | 8.4–15% | 3.1–5.6% | –[f] | 5.6–10% |
| Percentage of total emissions from electric power systems in the six-state study area[d] | | | 2.2–4.0% | 1.3–2.3% | 1.1–1.9% | 1.2–2.1% |
| Percentage of total emissions from all source categories in the six-state study area[e] | | | 1.2–2.1% | 0.17–0.31% | – | 0.36–0.65% |

[a] It is assumed that the SEZ would eventually have development on 80% of the lands and that a range of 5 acres (0.020 $km^2$) per MW (for parabolic trough technology) to 9 acres (0.036 $km^2$) per MW (power tower, dish engine, and PV technologies) would be required.

[b] Assumed a capacity factor of 20%.

[c] Composite combustion-related emission factors for $SO_2$, $NO_x$, Hg, and $CO_2$ of 2.82, 2.42, $1.6 \times 10^{-5}$, and 1,553 lb/MWh, respectively, were used for the state of Nevada.

[d] Emission data for all air pollutants are for 2005.

[e] Emission data for $SO_2$ and $NO_x$ are for 2002, while those for $CO_2$ are for 2005.

[f] A dash indicates not estimated.

Sources: EPA (2009a,b); WRAP (2009).

### 11.4.13.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce air quality impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Limiting dust generation during construction and operations is a required programmatic design feature under BLM's Solar Energy Program. These extensive fugitive dust control measures would keep off-site PM levels as low as possible during construction.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for air quality have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.4.14 Visual Resources

### 11.4.14.1 Affected Environment

The proposed Dry Lake Valley North SEZ boundaries have been revised and extend approximately 11.3 mi (18.2 km) north–south and approximately 5.7 mi (9.2 km) wide (see Figure 11.4.14.1-1). The boundaries of the proposed SEZ have been changed to exclude mainly the northern portion of the SEZ; 48,148 acres (195 $km^2$) were excluded. In addition, 3,657 acres (15 $km^2$) of wetland and dry lake within the SEZ boundaries have been identified as non-development areas. The remaining developable area within the SEZ now includes an area of 25,069 acres (101.5 $km^2$). Because of the reduction in size of the SEZ, the total acreage of the lands visible within the 25-mi (40-km) viewshed of the SEZ has decreased.

In addition, as a result of the boundary changes, the Dry Lake Valley North SEZ is now limited to the Shadscale-Dominated Saline Basins and the Salt Deserts Level IV ecoregions (Bryce et al. 2003). The SEZ now ranges in elevation from 4,620 ft (1,408 m) in the central portion to approximately 4,800 ft (1,463 m) in the northern portion.

The Draft Solar PEIS presented VRI information based on 2004 data. A new VRI for the Southern Nevada District was completed in October 2011 (BLM 2011a). An updated VRI map for the SEZ and surrounding lands is shown in Figure 11.4.14.1-1.

The Dry Lake Valley is an open valley blanketed with sage, rabbitbrush, and grasses (BLM 2011a). As shown in Figure 11.4.14.1-1, the updated VRI class for the SEZ is VRI Class III, indicating moderate relative visual values (BLM 2011a). The inventory indicates moderate scenic quality for the SEZ and its immediate surroundings. Areas to the east of the SEZ, near the Panaca Basin, received a high scenic quality rating and were assigned VRI Class II, including high relative visual value. Positive scenic quality attributes included its scarcity, adjacent scenery, color, and vegetation.

The SEZ also was assigned a high sensitivity level in the VRI. The Silver State OHV Trail surrounds the SEZ and is a popular trail for multiple uses. The VRI report indicates that the SEZ contains areas that are heavily used and have a high level of public interest. In addition, people have a high level of concern for the management of special areas located within and near the SEZ (BLM 2011a). For instance, the Chief Mountain SRMA is located to the southeast of the SEZ. Portions of this area are located within 1 mi (1.6 km) of the SEZ.

Lands in the Ely District Office within the 25-mi (40-km), 650-ft (198-m) viewshed of the revised SEZ include 11,081 acres (44.8 $km^2$) of VRI Class I areas; 80,472 acres (325.7 $km^2$) of VRI Class II areas, 265,234 acres (1,073.4 $km^2$) of VRI Class III areas, and 29,272 acres (118.5 $km^2$) of VRI Class IV areas.

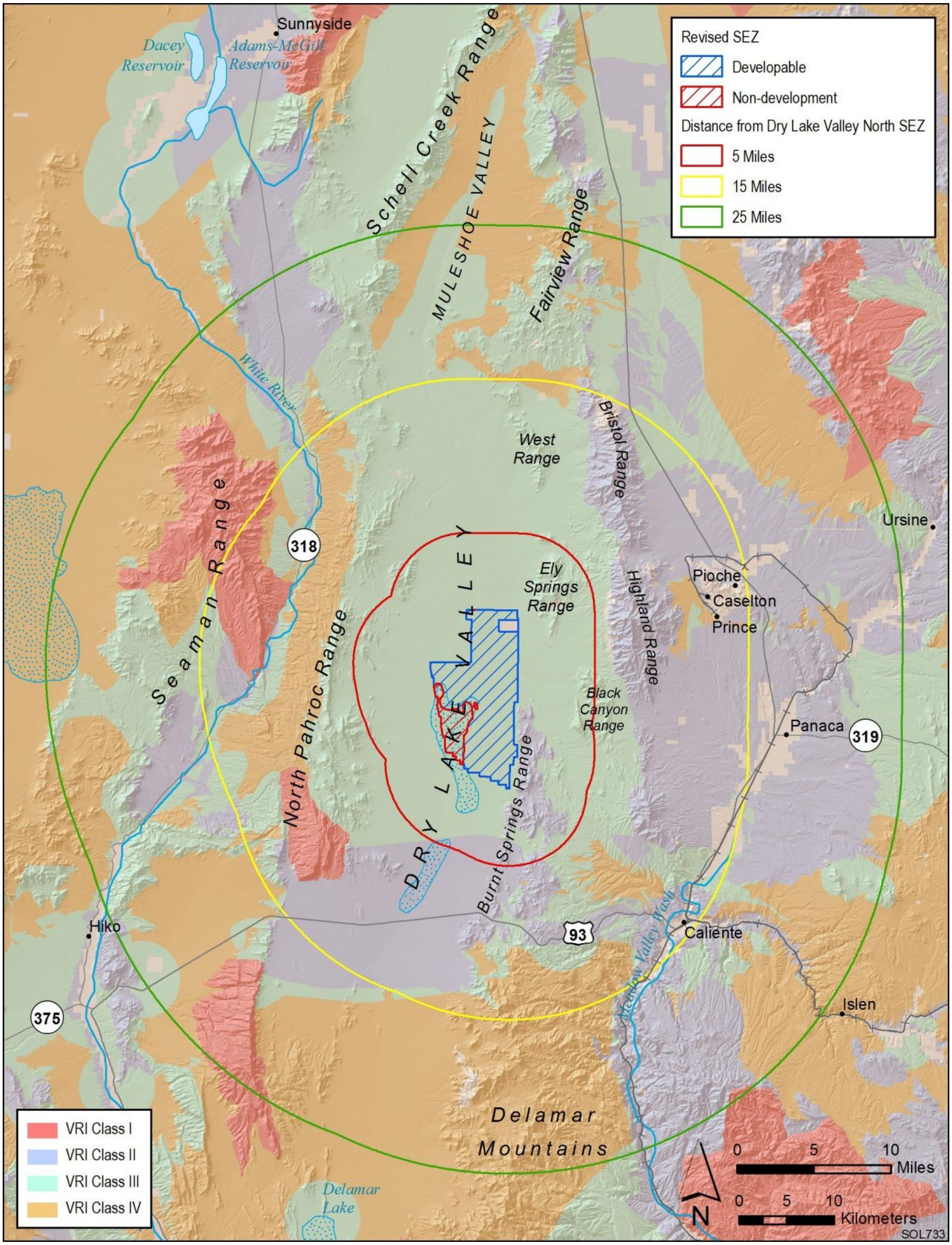


**FIGURE 11.4.14.1-1 Visual Resource Inventory Values for the Proposed Dry Lake Valley North SEZ as Revised**

### 11.4.14.2 Impacts

The reduction in size of the proposed Dry Lake Valley North SEZ substantially decreases the total visual impacts associated with solar energy development in the SEZ. It limits the total amount of solar facility infrastructure that would be visible and reduces the geographic extent of the visible infrastructure.

The reduction in size of the SEZ eliminated approximately 63% of the original SEZ. The resulting visual contrast reduction for any given point within view of the SEZ would vary greatly depending on the viewpoint's distance and direction from the SEZ. Contrast reduction generally would be greatest for viewpoints closest to the portions of the SEZ that were eliminated and especially for those that had broad wide-angle views of these areas. In general, contrast reductions also would be larger for elevated viewpoints relative to non-elevated viewpoints, because the reduction in area of the solar facilities would be more apparent when looking down at the SEZ than when looking across it.

#### *11.4.14.2.1 Impacts on the Proposed Dry Lake Valley North SEZ*

Although the reduction in size of the SEZ substantially reduces visual contrasts associated with solar development, solar development still would involve major modification of the existing character of the landscape; it likely would dominate the views from most locations within the SEZ. Additional impacts would occur as a result of the construction, operation, and decommissioning of related facilities, such as access roads and electric transmission lines. In general, strong visual contrasts from solar development still would be expected to be observed from viewing locations within the SEZ.

#### *11.4.14.2.2 Impacts on Lands Surrounding the Proposed Dry Lake Valley North SEZ*

For the Draft Solar PEIS, preliminary viewshed analyses were conducted to identify which lands surrounding the proposed SEZ could have views of solar facilities in at least some portion of the SEZ (see Appendices M and N of the Draft for important information on assumptions and limitations of the methods used). Four viewshed analyses were conducted, assuming four different heights representative of project elements associated with potential solar energy technologies: PV and parabolic trough arrays, 24.6 ft (7.5 m); solar dishes and power blocks for CSP technologies, 38 ft (11.6 m); transmission towers and short solar power towers, 150 ft (45.7 m); and tall solar power towers, 650 ft (198.1 m).

These same viewsheds were recalculated in order to account for the boundary changes described in the Supplement to the Draft Solar PEIS. Figure 11.4.14.2-1 shows the combined results of the viewshed analyses for all four solar technologies. The colored segments indicate areas with clear lines of sight to one or more areas within the SEZ and from which solar facilities within these areas of the SEZ would be expected to be visible, assuming the absence of screening vegetation or structures and adequate lighting and other atmospheric conditions. The light brown

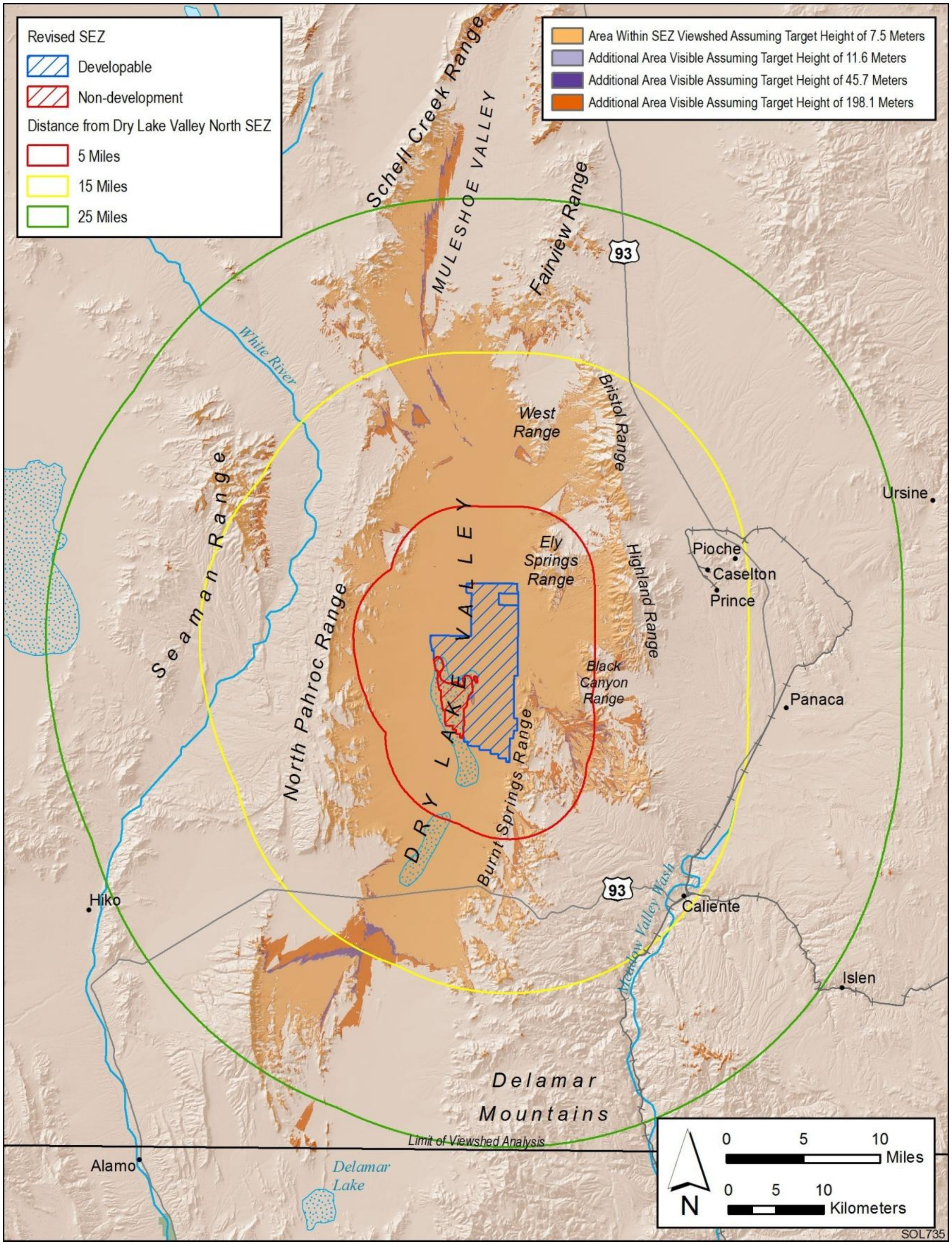


**FIGURE 11.4.14.2-1 Viewshed Analyses for the Proposed Dry Lake Valley North SEZ as Revised and Surrounding Lands, Assuming Viewshed Heights of 24.6 ft (7.5 m), 38 ft (11.6 m), 150 ft (45.7 m), and 650 ft (198.1 m) (shaded areas indicate lands from which solar development and/or associated structures within the SEZ could be visible)**

areas are locations from which PV and parabolic trough arrays located in the SEZ could be visible. Solar dishes and power blocks for CSP technologies would be visible from the areas shaded in light brown and the additional areas shaded in light purple. Transmission towers and short solar power towers would be visible from the areas shaded light brown, light purple, and the additional areas shaded in dark purple. Power tower facilities located in the SEZ could be visible from areas shaded light brown, light purple, dark purple, and at least the upper portions of power tower receivers in the additional areas shaded in medium brown.

#### *11.4.14.2.3 Impacts on Selected Federal-, State-, and BLM-Designated Sensitive Visual Resource Areas and Other Lands and Resources*

Figure 11.4.14.2-2 shows the results of a GIS analysis that overlays selected federal-, state-, and BLM-designated sensitive visual resource areas onto the combined tall solar power tower (650 ft [198.1 m]) and PV and parabolic trough array (24.6 ft [7.5 m]) viewsheds in order to illustrate which of these sensitive visual resource areas would have views of (and potentially be subject to visual impacts from) solar facilities within the SEZ. Distance zones that correspond with BLM's VRM system-specified foreground-middleground distance (5 mi [8 km]), background distance (15 mi [24 km]), and a 25-mi (40-km) distance zone are shown to indicate the effect of distance from the SEZ on impact levels. A similar analysis was conducted for the Draft Solar PEIS.

The scenic resources included in the analysis were as follows:

- National Parks, National Monuments, National Recreation Areas, National Preserves, National Wildlife Refuges, National Reserves, National Conservation Areas, National Historic Sites;

- Congressionally authorized Wilderness Areas;

- Wilderness Study Areas;

- National Wild and Scenic Rivers;

- Congressionally authorized Wild and Scenic Study Rivers;

- National Scenic Trails and National Historic Trails;

- National Historic Landmarks and National Natural Landmarks;

- All-American Roads, National Scenic Byways, State Scenic Highways, and BLM- and USFS-designated scenic highways/byways;

- BLM-designated Special Recreation Management Areas; and

- ACECs designated because of outstanding scenic qualities.

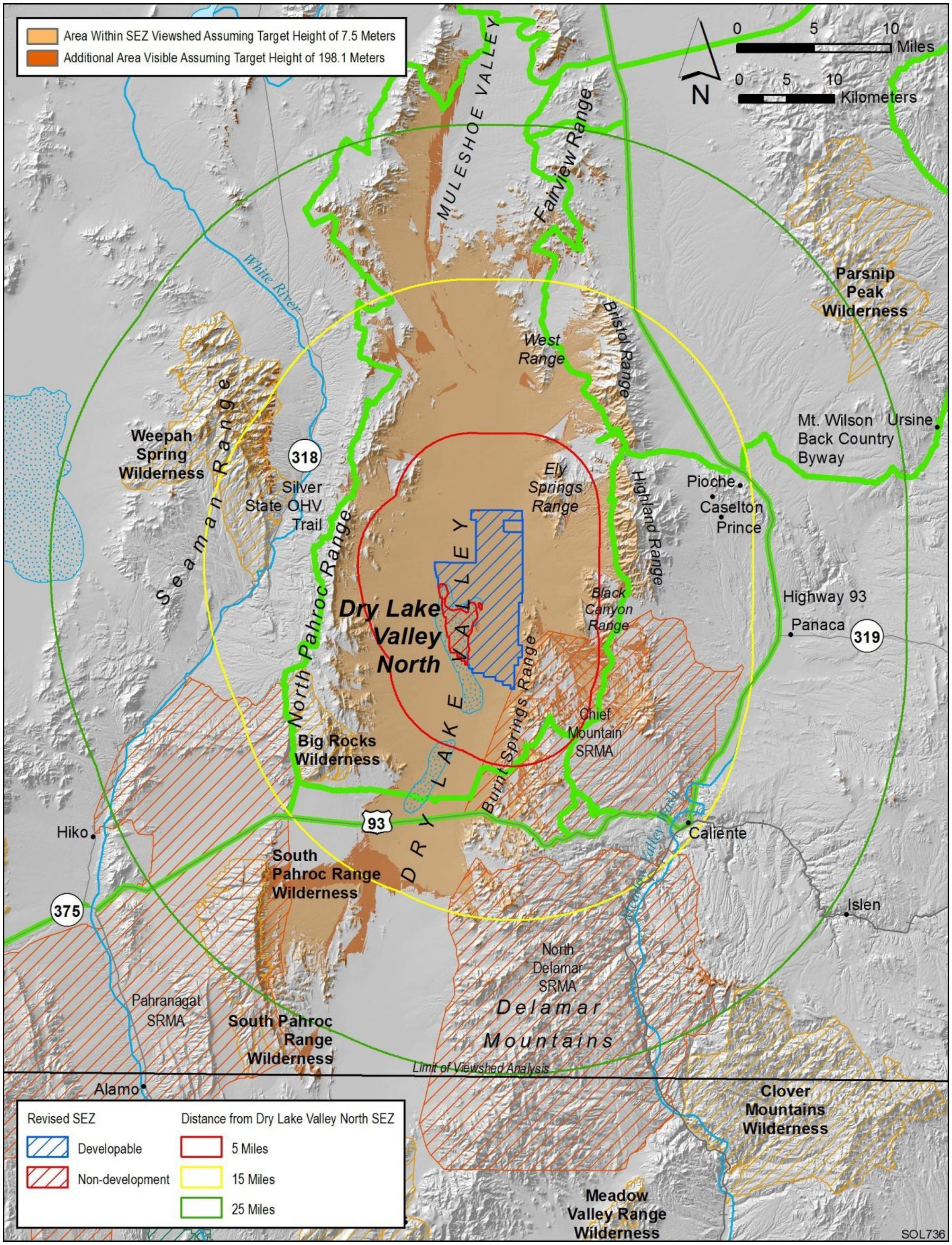


**FIGURE 11.4.14.2-2 Overlay of Selected Sensitive Visual Resource Areas onto Combined 650-ft (198.1-m) and 24.6-ft (7.5-m) Viewsheds for the Proposed Dry Lake Valley North SEZ as Revised**

The results of the GIS analyses are summarized in Table 11.4.14.2-1. The change in size of the SEZ alters the viewshed, such that the visibility of the SEZ and solar facilities within the SEZ from the surrounding lands would be reduced.

With the reduction in size of the SEZ, solar energy development within the SEZ would be expected to create minimal or weak visual contrasts for viewers within four of the surrounding scenic resource areas and other resources listed in Table 11.4.14.2-1. Moderate or strong visual contrasts would occur in the remaining areas, including the Big Rocks WA, the Weepah Springs WA, U.S. 93 Scenic Highway, the Silver State OHV Trail, and the Chief Mountain SRMA.

#### *11.4.14.2.4 Summary of Visual Resource Impacts for the Proposed Dry Lake Valley North SEZ*

The visual contrast analysis in the Draft Solar PEIS determined that because there could be multiple solar facilities within the Dry Lake Valley North SEZ, a variety of technologies employed, and a range of supporting facilities required, solar development within the SEZ would make it essentially industrial in appearance and would contrast strongly with the surrounding mostly natural-appearing landscape.

The reduction in size of the SEZ diminishes the visual contrast associated with solar facilities as seen both within the SEZ and from surrounding lands in both daytime and nighttime views. The reductions in visual contrast can be summarized as follows:

- Within the Dry Lake Valley North SEZ: Contrasts experienced by viewers in the northern and eastern portion of the SEZ would be reduced because of the elimination of 48,148 acres (195 km$^2$) of land within the SEZ; however, strong contrasts still would result in the remaining developable area. A reduction in contrasts also would be present in the southwest portion of the SEZ, where 3,657 acres (15 km$^2$) were identified as non-developable areas because of the presence of wetland and dry lake.

- Big Rocks WA: A reduction in contrasts would be anticipated because of the removal of non-developable lands in the southwest of the SEZ; however, solar development within the SEZ still would cause weak to strong contrasts, depending on viewer location within the WA.

- Clover Mountains WA: A reduction in contrasts would be anticipated because of the reduction in size of the SEZ; however, solar development within the SEZ still would cause minimal contrasts.

- Far South Egans WA: Far South Egans WA is no longer located within the 25-mi (40-km) viewshed; expected contrast levels would be lowered from “minimal to weak” to “none.”

**TABLE 11.4.14.2-1 Selected Potentially Affected Sensitive Visual Resources within a 25-mi (40-km) Viewshed of the Proposed Dry Lake Valley North SEZ as Revised, Assuming a Target Height of 650 ft (198.1 m)**

| | | Feature Area or Linear Distance | | |
|---|---|---|---|---|
| | | | Visible Between | |
| Feature Type | Feature Name (Total Acreage)[a,b] | Visible within 5 mi[c] | 5 and 15 mi | 25 and 25 mi |
| WAs | Big Rocks (12,929 acres) | 0 acres (0%) | 1,450 acres (11%) | 0 acres (0%) |
| | Clover Mountains (85,621 acres) | 0 acres (0%) | 0 acres (0%) | 15 acres (0%) |
| | South Pahroc Range (25,674 acres) | 0 acres (0%) | 0 acres (0%) | 2,316 acres (9%) |
| | Weepah Spring (51,309 acres) | 0 acres (0%) | 3,294 acres (6%) | 3,976 acres (8%) |
| Scenic Highway | U.S. 93 (149 mi) | 0 mi (0%) | 9 mi (6%) | 0 mi (0%) |
| | Silver State OHV Trail (240 mi) | 1.5 mi (0.6%) | 32.9 mi (14%) | 5.6 mi (2%) |
| SRMAs | Chief Mountain (111,151 acres) | 15,727 acres (14%) | 16,321 acres (15%) | 0 acres (0%) |
| | North Delamar (202,839 acres) | 0 acres (0%) | 3,289 acres (2%) | 861 acres (0%) |
| | Pahranagat (298,565 acres) | 0 acres (0%) | 0 acres (0%) | 8,114 acres (3%) |

[a] The Far South Egans and Parsnip Peak WAs are not included in this table. These areas were in the viewshed of the original proposed SEZ and were included in the corresponding table in the Draft Solar PEIS; however, these areas are not within the viewshed of the proposed SEZ as revised.

[b] To convert acres to $km^2$, multiply by 0.004047. To convert mi to km, multiply by 1.609.

[c] Percentage of total feature acreage or road length viewable.

- Parsnip Peak WA: Parsnip Peak WA is no longer located within visible portions of the 25 mi (40-km) viewshed; expected contrast levels would be lowered from “minimal to weak” to “none.”

- South Pahroc Range WA: A reduction in contrasts would be anticipated because of the removal of undevelopable lands in the southwest portion of the SEZ; expected contrast levels would be lowered from “weak” to “minimal to weak.”

- Weepah Springs WA: A reduction in contrasts would be anticipated because of the elimination of acreage in the northern portion of the SEZ; however, solar development within the SEZ still would cause weak to strong contrasts, depending on viewer location within the WA.

- U.S. 93 Scenic Highway: A reduction in contrasts would be anticipated because of the removal of non-developable lands in the southwest portion of the SEZ; solar development within the SEZ still would cause minimal to moderate contrasts, depending on viewer location on U.S. 93.

- Silver State OHV Trail: A reduction in contrasts would be anticipated because of the elimination of acreage in the northern and eastern portions of the SEZ; however, solar development within the SEZ still would cause weak to strong contrasts, depending on viewer location on the trail.

- Chief Mountain SRMA: A reduction in contrasts would be anticipated because of the revision of the SEZ. Approximately 23,387 acres (94.6 $km^2$) were visible within 5 mi (8.0 km) of the SEZ as it was originally proposed in the Draft Solar PEIS; with the elimination of the northern portion and the removal of non-developable areas, this has been reduced to approximately 15,727 acres (63.6 $km^2$). While the amount of acreage has been reduced, solar development within the SEZ still would cause weak to strong contrasts, depending on viewer location within the SRMA. The highest contrast levels would be expected at higher elevations in the western portion of the SRMA, with lower levels of contrast expected for lower elevations, particularly in the eastern and southern portions of the SRMA.

- North Delamar SRMA: A reduction in contrasts would be anticipated because of the reduction in size of the SEZ; expected contrast levels would be lowered from “weak” to “minimal.”

- Pahranagat SRMA: A reduction in contrasts would be anticipated because of the reduction in size of the SEZ; however, solar development within the SEZ still would cause minimal to weak contrasts, depending on viewer location within the SRMA.

### 11.4.14.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on visual resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. While application of the programmatic design features would reduce potential visual impacts somewhat, the degree of effectiveness of these design features can only be assessed at the site- and project-specific level. Given the large scale, reflective surfaces, and strong regular geometry of utility-scale solar energy facilities and the lack of screening vegetation and landforms within the SEZ viewshed, siting the facilities away from sensitive visual resource areas and other sensitive viewing areas would be the primary means of mitigating visual impacts. The effectiveness of other visual impact mitigation measures generally would be limited.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for visual resources have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.4.15 Acoustic Environment

### 11.4.15.1 Affected Environment

The developable area of the proposed Dry Lake Valley North SEZ was reduced by about 67%, from 76,874 acres (311.09 km$^2$) to 25,069 acres (101.45 km$^2$); mainly the northern portion of the SEZ was removed, and a wetland and dry lake area was identified as a non-development area. These reductions in the boundaries increased the distances to nearby residences or communities by up to 3 mi (5 km). Consequently, noise levels at these receptors will be somewhat lower than those presented in the Draft Solar PEIS.

Comments provided by the DoD on the Supplement to the Draft Solar PEIS noted that MTRs and operating areas authorized for supersonic flight by the Federal Aviation Administration (FAA) at and above 5,000-ft (1,524-m) AGL exist directly above the proposed Dry Lake Valley North SEZ. The comments indicated that noise and associated overpressures created by authorized supersonic flight above and proximal to the SEZ could adversely affect solar technology and/or infrastructure.

### 11.4.15.2 Impacts

The screening-level noise levels estimated in both the Draft Solar PEIS and this Final Solar PEIS included attenuation due to geometrical spreading and ground effects over flat terrain only. With the inclusion of other attenuation mechanisms such as air absorption and screening effects of natural barriers (i.e., topographic features), noise levels at receptors more than several miles from the source would typically be below background levels. Note that the closest communities such as Caselton and Prince are located more than 12 mi (19 km) east of the SEZ and screened from the area by the Highland and Black Canyon mountain ranges.

#### *11.4.15.2.1 Construction*

The noise impact analysis in the Draft Solar PEIS assumed that a maximum of three projects (9,000 acres [36.4 $km^2$]) would be developed at any one time within the SEZ. With the reduction in size of the proposed SEZ, the noise impact analysis for this Final Solar PEIS assumes that two projects (6,000 acres [24.3 $km^2$]) would be under development at a given time.

The conclusions in the Draft Solar PEIS remain valid. With the updated SEZ boundaries, estimated construction noise levels from a single project at the nearest residences would be about 14 dBA, and for a 10-hour daytime work schedule, a 40-dBA $L_{dn}$ is estimated, that is, no contribution from construction activities. If two projects were to be built in the eastern portion of the proposed SEZ, noise levels at the nearest residences would be about 3 dBA higher, but there would be no increase in $L_{dn}$. In either case, construction noise would be well below a typical daytime mean rural background level of 40 dBA, and the estimated $L_{dn}$ at these residences would be well below the EPA guidance of 55 dBA $L_{dn}$ for residential areas.

As stated in the Draft Solar PEIS, noise at the Chief Mountains SRMA, which is managed primarily for motorized OHV recreation, is not likely to be an issue.

Construction noise and vibration impacts would be the same or less than those presented in the Draft Solar PEIS, and the conclusions of the Draft remain valid. Construction would cause minimal, unavoidable, but localized, short-term noise impacts on neighboring communities. No adverse vibration impacts are anticipated from construction activities, including pile driving for dish engines.

#### *11.4.15.2.2 Operations*

Because of boundary changes and the identification of non-development areas for the proposed Dry Lake Valley North SEZ, noise impacts for this Final Solar PEIS were remodeled.

##### **Parabolic Trough and Power Tower**

If TES were used, the effect of temperature inversions at night could increase the noise levels associated with operations. With the updated boundaries, nighttime noise levels at the nearest residences estimated for this Final Solar PEIS would be expected to be at most the same as the typical nighttime mean rural background level of 30 dBA. However, the noise level would be much lower than this value if air absorption and other attenuation mechanisms were considered, and the day-night average noise level would be about 41 dBA $L_{dn}$, well below the EPA guideline of 55 dBA $L_{dn}$ for residential areas. The conclusion of the Draft Solar PEIS that operating parabolic trough or power tower facilities using TES could result in minimal adverse noise impacts on the nearest residences remains valid.

**Dish Engines**

The reduction in size of the proposed Dry Lake Valley North SEZ by about 67% would reduce the number of dish engines by a similar percentage. The estimated noise level at the nearest residences would be about 34 dBA, lower than the typical daytime mean rural background level of 40 dBA, and for 12 hours of operation, about 41 dBA $L_{dn}$, well below the EPA guideline of 55 dBA $L_{dn}$ for residential areas. The conclusion of the Draft Solar PEIS that noise levels at the nearest residences caused by operating a dish engine facility could cause minor adverse impacts on the nearest residence, depending on background noise levels and meteorological conditions, remains valid.

Changes in the proposed SEZ boundaries would not affect the discussions of vibration, transformer and switchyard noise, and transmission line corona discharge presented in the Draft Solar PEIS. Noise impacts from these sources would be negligible.

#### *11.4.15.2.3 Decommissioning and Reclamation*

The discussion in the Draft Solar PEIS remains valid. Decommissioning and reclamation activities would be of short duration, and their potential noise impacts would be minor and temporary. Potential noise and vibration impacts on surrounding communities would be correspondingly less than those for construction activities.

### 11.4.15.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce noise impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some protection from noise impacts. Because of the considerable separation distances, activities within the proposed Dry Lake Valley North SEZ during construction and operation would be anticipated to cause only minimal increases in noise levels at the nearest residences and to have minor impacts on nearby specially designated areas.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features were identified for noise. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.4.16 Paleontological Resources

### 11.4.16.1 Affected Environment

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- The change in developable area for the proposed Dry Lake Valley North SEZ has increased the percentage of playa deposits, PFYC Class 3b, relative to the alluvial deposits that are PFYC Class 2.

- The BLM Regional Paleontologist may have additional information regarding the paleontological potential of the SEZ and be able to update the temporary assignment of PFYC Class 2 and 3b as used in the Draft Solar PEIS.

### 11.4.16.2 Impacts

The assessment provided in the Draft Solar PEIS remains valid. Few, if any, impacts on significant paleontological resources are likely to occur in the proposed Dry Lake Valley North SEZ. However, a more detailed look at the geological deposits of the SEZ is needed to determine whether a paleontological survey is warranted.

### 11.4.16.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on paleontological resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Impacts would be minimized through the implementation of required programmatic design features, including a stop-work stipulation in the event that paleontological resources are encountered during construction, as described in Section A.2.2 of Appendix A.

On the basis of analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for paleontological resources have been identified. If the geological deposits are determined to be as described in the Draft Solar PEIS and are predominantly classified as PFYC Class 2, mitigation of paleontological resources within most of the proposed Dry Lake Valley North SEZ would not likely be necessary. The need for and nature of any SEZ-specific design features for the remaining portions of the SEZ would depend on the results of future paleontological investigations. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

As additional information on paleontological resources (e.g., from regional paleontologists or from new surveys) becomes available, the BLM will post the data to the project Web site (http://solareis.anl.gov) for use by applicants, the BLM, and other stakeholders.

## 11.4.17 Cultural Resources

### 11.4.17.1 Affected Environment

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- The amount of land that has been surveyed for cultural resources has increased slightly from 2.8 to 3.5% of the SEZ, totaling 880 acres (3.6 $km^2$).

- The number of cultural resource sites in the SEZ has decreased from 53 to 21 sites; however, the 4 sites identified in the Draft Solar PEIS as potentially eligible for listing in the NRHP are still located within the SEZ.

- The historic mining claims located to the north and east of the SEZ are no longer within the 5-mi (8-km) buffer.

- The distance from the SEZ boundary to the NRHP-listed Bristol Wells site has increased from 5 mi (8 km) to 14 mi (23 km).

- A tribally approved ethnographic study of the Dry Lake Valley North SEZ was not conducted; however, ethnographic studies of the Delamar Valley SEZ immediately to the south and other nearby SEZs were conducted (SWCA and University of Arizona 2011), and some of that information could be applicable to the Dry Lake Valley North SEZ. Tribes have expressed concern about the cultural resources that are found in the SEZs and their encompassing landscape, as well as important water sources and traditional plant and animal resources. The Paiute are concerned with the effects on their cultural and spiritual lifeways of harnessing and distributing the sun's energy.

- Additional information may be available to characterize the area surrounding the proposed SEZ in the future (after the Final Solar PEIS is completed), as follows:
  - Results of a Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ, (2) trail networks through existing ethnographic reports, and (3) overall cultural sensitivity of the landscape.
  - Results of a Class II stratified random sample survey of 1,253 acres (5 $km^2$), or roughly 5% of the SEZ. The Class II survey is being conducted by the BLM to meet its ongoing Section 110 responsibilities under the NHPA. The objectives of the Class II surveys currently under contract are to reliably predict the density, diversity, and distribution of archaeological sites within each SEZ in Arizona, California, and Nevada and create sensitivity zones based on projected site density, complexity, likely presence of human burials, and/or other tribal concerns. The BLM will continue to request funding to support additional Class II sample

inventories in the SEZ areas. Areas of interest, such as dune areas and along washes, as determined through a Class I review and, if appropriate, some subsurface testing of dune and/or colluvium areas, should be considered in sampling strategies for future surveys.

  – Continuation of government-to-government consultation as described in Section 2.4.3 of the Supplement to the Draft Solar PEIS and IM 2012-032 (BLM 2011b), including follow-up to recent ethnographic studies with tribes not included in the original studies to determine whether those tribes have similar concerns.

### 11.4.17.2 Impacts

As stated in the Draft Solar PEIS, direct impacts on significant cultural resources could occur in the proposed Dry Lake Valley North SEZ; however, further investigation is needed. Impacts on prehistoric cultural resources are possible in the proposed Dry Lake Valley North SEZ in the dry lake, alluvial fans, and dune areas in the southern portion of the SEZ. Impacts on historic resources are also possible, but to a lesser degree. The following update is based on the revised boundaries of the SEZ:

- Thirty-two fewer sites are potentially affected within the reduced footprint of the SEZ; however, there are still four sites located in the proposed SEZ that are known to be eligible for listing in the NRHP.

### 11.4.17.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on cultural resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Programmatic design features assume that the necessary surveys, evaluations, and consultations will occur.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature for cultural resources has been identified:

- The existing access road that connects the proposed SEZ to U.S. 93 should be upgraded instead of constructing a new access road to reduce ground disturbances and the potential for impacts on cultural resources.

Additional SEZ-specific design features would be determined in consultation with the Nevada SHPO and affected tribes and would depend on the results of future investigations. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.4.18 Native American Concerns

### 11.4.18.1 Affected Environment

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- A tribally approved ethnographic study of the Dry Lake Valley North SEZ was not conducted; however, ethnographic studies of the Delamar Valley SEZ and other nearby SEZs were conducted (SWCA and University of Arizona 2011), and some of that information could be applicable to the Dry Lake Valley North SEZ. Tribes have expressed concerns about the cultural resources that are found in the SEZs and their encompassing landscape, as well as important water sources and traditional plant and animal resources.

- The Paiute are concerned with the effects on their cultural and spiritual lifeways of harnessing and distributing the sun's energy.

- Tribal representatives from the Moapa Band of Paiute Indians believe that all cultural resources and landscapes are important in helping the Southern Paiute to understand their past, present, and future.

- Robber Roost Hills, Stapely Knoll, Fly Springs Range, Highland Range, North Pahroc Range, Black Rock Knoll, Clover Mountains, Delamar Mountains, and Fairview Range are all elevated areas found outside of the Dry Lake Valley North SEZ that may be of significant importance to tribes. Visual impacts on the valley from mountain summits are likely to occur as a result of solar development.

- Portions of Coyote Wash, Bailey Wash, Silverhorn Wash, and Wheatgrass Wash intersect the proposed Dry Lake Valley North SEZ and feed into the Pleistocene Dry Lake. A series of springs is found in the Delamar Mountains, Fairview Range, and North Pahroc Range. Meadow Valley Wash is found to the east of the Delamar and Clover Mountains. These water resources are likely important to tribes and would be directly affected by solar development.

- Mining sites, ranching sites, and the San Pedro–Los Angeles–Salt Lake Railroad located in the surrounding area may have significant historical importance to the Southern Paiute and Western Shoshone and may be affected by solar development.

- Plants and animals used as traditional sources of food and medicine may reside in the proposed SEZ and would be directly affected by solar development.

- Rock art and ceremonial areas may exist in areas of importance to the Southern Paiute and Western Shoshone. Possible locations include the foothills of surrounding mountain ranges and their associated canyons. Depending on their locations, these areas may be directly or indirectly affected by solar development within the proposed SEZ.

#### 11.4.18.2 Impacts

The description of potential concerns provided in the Draft Solar PEIS remains valid. During past project-related consultation, the Southern Paiute have expressed concern over project impacts on a variety of resources, including food plants, medicinal plants, plants used in basketry, plants used in construction, large game animals, small game animals, birds, and sources of clay, salt, and pigments (Stoffle and Dobyns 1983). The construction of utility-scale solar energy facilities within the proposed SEZ would result in the destruction of some plants important to Native Americans and the habitat of some traditionally important animals.

In addition to the impacts discussed in the Draft Solar PEIS, the following impacts have been identified:

- Development within the proposed Dry Lake Valley North SEZ could result in visual impacts on Dry Lake Valley from surrounding elevated areas and mountain tops.

- Development within the proposed Dry Lake Valley North SEZ may affect the spiritual connection that the Southern Paiute have to water as well as the quantity of water naturally stored in underground aquifers. Tribes are also deeply concerned that energy development within the area will greatly reduce the amount of water that is available to the tribe and to plants and animals in the valley.

- Development of a project area within the SEZ will directly affect culturally important plant and animal resources as it will likely require the grading of the project area.

#### 11.4.18.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on Native American concerns are described in Section A.2.2 of Appendix A of this Final Solar PEIS. For example, impacts would be minimized through the avoidance of sacred sites, water sources, and tribally important plant and animal species. Programmatic design features require that the necessary surveys, evaluations, and consultations would occur. The tribes would be notified regarding the results of archaeological surveys, and they would be contacted immediately upon the discovery of Native American human remains and associated cultural items.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes in SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features to address Native American concerns have been identified. The need for and nature of SEZ-specific design features would be determined during government-to-government consultation with the affected tribes as part of the process of preparing parcels for competitive offer and subsequent project-specific analysis. Potentially significant sites and landscapes in the vicinity of the SEZ associated with numerous washes, mountain springs, and other water sources, the Delamar Mountains, Fairview Range, North Pahroc Range, Robber Roost Hills, Stapely Knoll, Fly Springs Range, Highland Range, Black Rock Knoll, and the Clover Mountains, as well as trails, mineral sources, historic mining and ranching sites, burial sites, and other ceremonial and rock art areas, and traditionally important plant and animal resources should be considered and discussed during consultation.

## 11.4.19 Socioeconomics

### 11.4.19.1 Affected Environment

Although the boundaries of the Dry Lake Valley North SEZ have been changed, the socioeconomic ROI, the area in which site employees would live and spend their wages and salaries and into which any in-migration would occur, includes the same counties and communities as described in the Draft Solar PEIS, meaning that no updates to the affected environment information given in the Draft Solar PEIS are required.

### 11.4.19.2 Impacts

Socioeconomic resources in the ROI around the SEZ could be affected by solar energy development through the creation of direct and indirect employment and income, the generation of direct sales and income taxes, SEZ acreage rental and capacity payments to the BLM, the in-migration of solar facility workers and their families, and impacts on local housing markets and local community service employment. The impact assessment has been updated in the following sections.

#### *11.4.19.2.1 Solar Trough*

**Construction**

Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of solar trough technologies would be up to 6,048 jobs (Table 11.4.19.2-1). Construction activities would constitute 0.4 % of total ROI employment.

**TABLE 11.4.19.2-1 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Dry Lake Valley North SEZ as Revised with Solar Trough Facilities**

| Parameter | Maximum Annual Construction Impacts[a] | Annual Operations Impacts[b] |
|---|---|---|
| Employment (no.) | | |
| Direct | 3,488 | 874 |
| Total | 6,048 | 1,347 |
| Income[c] | | |
| Total | 369.5 | 50.7 |
| Direct state taxes[c] | | |
| Sales | 2.4 | 0.3 |
| Income | 0.7 | 0.1 |
| BLM payments[c,d] | | |
| Acreage-related fee | NA[e] | 1.6 |
| Capacity fee[f] | NA | 26.4 |
| In-migrants (no.) | 1,486 | 111 |
| Vacant housing[g] (no.) | 513 | 69 |
| Local community service employment | | |
| Teachers (no.) | 13 | 1 |
| Physicians (no.) | 3 | 0 |
| Public safety (no.) | 3 | 0 |

a Construction impacts were based on the development at the site in a single year; it was assumed that several facilities with a combined capacity of up to 1,200 MW (corresponding to 6,000 acres [18 km$^2$] of land disturbance) could be built.

b Operations impacts were based on full build-out of the site, producing a total output of 4,011 MW.

c Values are reported in $ million 2008.

d There is currently no individual income tax in Nevada; data provided are for workers who would reside in Utah.

e NA = not applicable.

f The BLM annual capacity payment was based on a fee of $6,570/MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010b), assuming a solar facility with no storage capability and full build-out of the site. Projects with 3 or more hours of storage would generate higher payments, based on a fee of $7,884/MW.

g Construction activities would affect vacant rental housing; operations activities would affect vacant owner-occupied housing.

A solar facility would also produce $369.5 million in income. Direct sales taxes would be $2.4 million; direct income taxes in Utah, $0.7 million.

Given the scale of construction activities and the low likelihood that the entire construction workforce in the required occupational categories would be available within the ROI, construction of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with up to 1,486 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility construction on the number of vacant rental housing units would not be expected to be large, with up to 513 rental units expected to be occupied in the ROI. This occupancy rate would represent 0.8% of the vacant rental units expected to be available in the ROI.

In addition to the potential impact on housing markets, in-migration would affect community service employment (education, health, and public safety). An increase in such employment would be required to meet existing levels of service in the ROI. Accordingly, up to 13 new teachers, 3 physicians, and 3 public safety employee (career firefighters and uniformed police officers) would be required in the ROI. These increases would represent 0.1% of total ROI employment expected in these occupations.

**Operations**

Total operations employment impacts in the ROI (including direct and indirect impacts) of a full build-out of the SEZ using solar trough technologies would be 1,347 jobs (Table 11.4.19.2-1). Such a solar facility would also produce $50.7 million in income. Direct sales taxes would be $0.3 million; direct income taxes in Utah, $0.1 million. On the basis of fees established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010b), acreage–related fees would be $1.6 million, and solar generating capacity fees would total at least $26.4 million.

As for the construction workforce, operation of a solar facility likely would require some in-migration of workers and their families from outside the ROI, with up to 111 persons in migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility operation on the number of vacant owner-occupied housing units would not be expected to be large, with up to 69 owner-occupied units expected to be occupied in the ROI.

In addition to the potential impact on housing markets, in-migration would affect community service (health, education, and public safety) employment. An increase in such employment would be required to meet existing levels of service in the provision of these services in the ROI. Accordingly, up to one new teacher would be required in the ROI.

#### *11.4.19.2.2 Power Tower*

**Construction**

Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of power tower technologies would be up to 2,409 jobs (Table 11.4.19.2-2). Construction activities would constitute 0.2% of total ROI employment. Such a solar facility would also produce $147.2 million in income. Direct sales taxes would be $0.9 million; direct income taxes in Utah, $0.3 million.

Given the scale of construction activities and the low likelihood that the entire construction workforce in the required occupational categories would be available within the ROI, construction of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with up to 592 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility construction on the number of vacant rental housing units would not be expected to be large, with up to 204 rental units expected to be occupied in the ROI. This occupancy rate would represent 0.3% of the vacant rental units expected to be available in the ROI.

In addition to the potential impact on housing markets, in-migration would affect community service (education, health, and public safety) employment. An increase in such employment would be required to meet existing levels of service in the ROI. Accordingly, up to five new teachers, one physician, and one public safety employee would be required in the ROI. These increases would represent less than 0.1% of total ROI employment expected in these occupations.

**Operations**

Total operations employment impacts in the ROI (including direct and indirect impacts) of a full build-out of the SEZ using power tower technologies would be 613 jobs (Table 11.4.19.2-2). Such a solar facility would also produce $21.2 million in income. Direct sales taxes would be less than $0.1 million; direct income taxes in Utah, less than $0.1 million. On the basis of fees established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010b), acreage–related fees would be $1.6 million, and solar generating capacity fees would total at least $14.6 million.

As for the construction workforce, operation of a solar facility means that some in-migration of workers and their families from outside the ROI would be required, with up to 58 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility operation on the number of vacant owner-occupied housing units would not be expected to be large, with up to 36 owner-occupied units expected to be required in the ROI.

**TABLE 11.4.19.2-2 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Dry Lake Valley North SEZ as Revised with Power Tower Facilities**

| Parameter | Maximum Annual Construction Impacts[a] | Annual Operations Impacts[b] |
|---|---|---|
| Employment (no.) | | |
| Direct | 1,389 | 451 |
| Total | 2,409 | 613 |
| Income[c] | | |
| Total | 147.2 | 21.2 |
| Direct state taxes[c] | | |
| Sales | 0.9 | <0.1 |
| Income | 0.3 | <0.1 |
| BLM payments[c,d] | | |
| Acreage-related fee | NA[e] | 1.6 |
| Capacity fee[f] | NA | 14.6 |
| In-migrants (no.) | 592 | 58 |
| Vacant housing[g] (no.) | 204 | 36 |
| Local community service employment | | |
| Teachers (no.) | 5 | 1 |
| Physicians (no.) | 1 | 0 |
| Public safety (no.) | 1 | 0 |

[a] Construction impacts were based on the development at the site in a single year; it was assumed that several facilities with a combined capacity of up to 667 MW (corresponding to 6,000 acres [18 km$^2$] of land disturbance) could be built.

[b] Operations impacts were based on full build-out of the site, producing a total output of 2,228 MW.

[c] Values are reported in $ million 2008.

[d] There is currently no individual income tax in Nevada; data provided are for workers who would reside in Utah.

[e] NA = not applicable.

[f] The BLM annual capacity payment was based on a fee of $6,570/MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010b), assuming a solar facility with no storage capability, and full build-out of the site. Projects with 3 or more hours of storage would generate higher payments, based on a fee of $7,884/MW.

[g] Construction activities would affect vacant rental housing; operations activities would affect vacant owner-occupied housing.

In addition to the potential impact on housing markets, in-migration would affect community service (education, health, and public safety) employment. An increase in such employment would be required to meet existing levels of service in the ROI. Accordingly, up to one new teacher would be required in the ROI.

#### *11.4.19.2.3 Dish Engine*

**Construction**

Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of dish engine technologies would be up to 979 jobs (Table 11.4.19.2-3). Construction activities would constitute 0.1% of total ROI employment. Such a solar facility would also produce $59.8 million in income. Direct sales taxes would be $0.4 million; direct income taxes in Utah, $0.1 million.

Given the scale of construction activities and the low likelihood that the entire construction workforce in the required occupational categories would be available within the ROI, construction of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with up to 241 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility construction on the number of vacant rental housing units would not be expected to be large, with up to 83 rental units expected to be occupied in the ROI. This occupancy rate would represent 0.1% of the vacant rental units expected to be available in the ROI.

In addition to the potential impact on housing markets, in-migration would affect community service (education, health, and public safety) employment. An increase in such employment would be required to meet existing levels of service in the ROI. Accordingly, up to two new teachers, one physician, and one public safety employee would be required in the ROI. These increases would represent less than 0.1% of total ROI employment expected in these occupations.

**Operations**

Total operations employment impacts in the ROI (including direct and indirect impacts) of a full build-out of the SEZ using dish engine technologies would be 596 jobs (Table 11.4.19.2-3). Such a solar facility would also produce $20.6 million in income. Direct sales taxes would be $0.1 million; direct income taxes in Utah, $0.1 million. On the basis of fees established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010b), acreage-related fees would be $1.6 million, and solar generating capacity fees would total at least $14.6 million.

**TABLE 11.4.19.2-3 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Dry Lake Valley North SEZ as Revised with Dish Engine Facilities**

| Parameter | Maximum Annual Construction Impacts[a] | Annual Operations Impacts[b] |
|---|---|---|
| Employment (no.) | | |
| Direct | 565 | 439 |
| Total | 979 | 596 |
| Income[c] | | |
| Total | 59.8 | 20.6 |
| Direct state taxes[c] | | |
| Sales | 0.4 | <0.1 |
| Income | 0.1 | <0.1 |
| BLM payments[c,d] | | |
| Acreage-related fee | NA[e] | 1.6 |
| Capacity fee[f] | NA | 14.6 |
| In-migrants (no.) | 241 | 56 |
| Vacant housing[g] (no.) | 83 | 35 |
| Local community service employment | | |
| Teachers (no.) | 2 | 0 |
| Physicians (no.) | 1 | 0 |
| Public safety (no.) | 1 | 0 |

[a] Construction impacts were based on the development at the site in a single year; it was assumed that several facilities with a combined capacity of up to 667 MW (corresponding to 6,000 acres [24 $km^2$] of land disturbance) could be built.

[b] Operations impacts were based on full build-out of the site, producing a total output of 2,228 MW.

[c] Values are reported in $ million 2008.

[d] There is currently no individual income tax in Nevada; data provided are for workers who would reside in Utah.

[e] NA = not applicable.

[f] The BLM annual capacity payment was based on a fee of $6,570/MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010b), assuming a solar facility with no storage capability, and full build-out of the site. Projects with 3 or more hours of storage would generate higher payments, based on a fee of $7,884/MW.

[g] Construction activities would affect vacant rental housing; operations activities would affect vacant owner-occupied housing.

As for the construction workforce, operation of a dish engine solar facility means that some in-migration of workers and their families from outside the ROI would be required, with up to 56 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility operation on the number of vacant owner-occupied housing units would not be expected to be large, with up to 35 owner-occupied units expected to be required in the ROI.

No new community service employment would be required to meet existing levels of service in the ROI.

#### *11.4.19.2.4 Photovoltaic*

**Construction**

Total construction employment impacts in the ROI (including direct and indirect impacts) from the use of PV technologies would be up to 457 jobs (Table 11.4.19.2-4). Construction activities would constitute less than 0.1 % of total ROI employment. Such a solar development would also produce $27.9 million in income. Direct sales taxes would be $0.2 million; direct income taxes in Utah, $0.1 million.

Given the scale of construction activities and the low likelihood that the entire construction workforce in the required occupational categories would be available with the ROI, construction of a solar facility would mean that some in-migration of workers and their families from outside the ROI would be required, with up to 112 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility construction on the number of vacant rental housing units would not be expected to be large, with up to 39 rental units expected to be occupied in the ROI. This occupancy rate would represent 0.1% of the vacant rental units expected to be available in the ROI.

In addition to the potential impact on housing markets, in-migration would affect community service (education, health, and public safety) employment. An increase in such employment would be required to meet existing levels of service in the ROI. Accordingly, up to one new teacher would be required in the ROI. This increase would represent less than 0.1% of total ROI employment expected in this occupation.

**Operations**

Total operations employment impacts in the ROI (including direct and indirect impacts) of a full build-out of the SEZ using PV technologies would be 59 jobs (Table 11.4.19.2-4). Such a solar facility would also produce $2.1 million in income. Direct sales taxes would be less than

**TABLE 11.4.19.2-4 ROI Socioeconomic Impacts Assuming Full Build-out of the Proposed Dry Lake Valley North SEZ as Revised with PV Facilities**

| Parameter | Maximum Annual Construction Impacts[a] | Annual Operations Impacts[b] |
|---|---|---|
| Employment (no.) | | |
| Direct | 263 | 44 |
| Total | 457 | 59 |
| Income[c] | | |
| Total | 27.9 | 2.1 |
| Direct state taxes[c] | | |
| Sales | 0.2 | <0.1 |
| Income | 0.1 | <0.1 |
| BLM payments[c,d] | | |
| Acreage-related fee | NA[e] | 1.6 |
| Capacity fee[f] | NA | 11.7 |
| In-migrants (no.) | 112 | 6 |
| Vacant housing[g] (no.) | 39 | 3 |
| Local community service employment | | |
| Teachers (no.) | 1 | 0 |
| Physicians (no.) | 0 | 0 |
| Public safety (no.) | 0 | 0 |

[a] Construction impacts were based on the development at the site in a single year; it was assumed that several facilities with a combined capacity of up to 667 MW (corresponding to 6,000 acres [24 $km^2$] of land disturbance) could be built.

[b] Operations impacts were based on full build-out of the site, producing a total output of 2,228 MW.

[c] Values are reported in $ million 2008.

[d] There is currently no individual income tax in Nevada; data provided are for workers who would reside in Utah.

[e] NA = not applicable.

[f] The BLM annual capacity payment was based on a fee of $5,256/MW, established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010b), assuming full build-out of the site.

[g] Construction activities would affect vacant rental housing; operations activities would affect owner-occupied housing.

$0.1 million; direct income taxes in Utah would be less than $0.1 million. On the basis of fees established by the BLM in its Solar Energy Interim Rental Policy (BLM 2010b), acreage–related fees would be $1.6 million, and solar generating capacity fees would total at least $11.7 million.

As for the construction workforce, operation of a PV solar facility would likely require some in-migration of workers and their families from outside the ROI, with up to 6 persons in-migrating into the ROI. Although in-migration may potentially affect local housing markets, the relatively small number of in-migrants and the availability of temporary accommodations (hotels, motels, and mobile home parks) mean that the impact of solar facility operation on the number of vacant owner-occupied housing units would not be expected to be large, with up to 3 owner-occupied units expected to be required in the ROI.

No new community service employment would be required to meet existing levels of service in the ROI.

#### 11.4.19.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce socioeconomic impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will reduce the potential for socioeconomic impacts during all project phases.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features to address socioeconomic impacts have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.4.20 Environmental Justice

#### 11.4.20.1 Affected Environment

The data presented in the Draft Solar PEIS have changed because of the change in boundaries of the proposed Dry Lake Valley North SEZ. The affected environment information for environmental justice presented in the Draft Solar PEIS has also changed, as reflected in the following discussion.

The data in Table 11.4.20.1-1 show the minority and low-income composition of the total population located within a 50-mi (80-km) radius of the proposed Dry Lake Valley North SEZ based on 2000 Census data and CEQ guidelines (CEQ 1997). Individuals identifying themselves as Hispanic or Latino are included in the table as a separate entry. However, because Hispanics can be of any race, this number also includes individuals who also identify themselves as being part of one or more of the population groups listed in the table.

**TABLE 11.4.20.1-1 Minority and Low-Income Populations within the 50-mi (80-km) Radius Surrounding the Proposed Dry Lake Valley North SEZ as Revised**

| Parameter | Nevada | Utah |
|---|---|---|
| Total population | 6,240 | 5,523 |
| White, non-Hispanic | 5,378 | 5,015 |
| Hispanic or Latino | 387 | 264 |
| Non-Hispanic or Latino minorities | 475 | 244 |
| One race | 329 | 185 |
| Black or African American | 73 | 8 |
| American Indian or Alaskan Native | 211 | 151 |
| Asian | 18 | 15 |
| Native Hawaiian or Other Pacific Islander | 1 | 3 |
| Some other race | 26 | 8 |
| Two or more races | 146 | 59 |
| Total minority | 862 | 508 |
| Low-income | 754 | 865 |
| Percentage minority | 13.8 | 9.2 |
| State percentage minority | 17.2 | 15.9 |
| Percentage low-income | 12.8 | 15.0 |
| State percentage low-income | 10.5 | 9.4 |

Source: U.S Bureau of the Census (2009a,b).

Minority and low-income individuals are located in the 50-mi (80-km) area around the boundary of the SEZ. Within the 50-mi (80-km) radius in Nevada, 13.8% of the population is classified as minority, while 12.8% is classified as low income. However, the number of minority individuals does not exceed 50% of the total population in the area and does not exceed the state average by 20 percentage points or more; thus, in aggregate, there is no minority population in the SEZ area based on 2000 Census data and CEQ guidelines. The number of low-income individuals does not exceed the state average by 20 percentage points or more and does not exceed 50% of the total population in the area; thus, in aggregate, there are no low-income populations in the Nevada portion of the SEZ.

In the Utah portion of the 50-mi (80-km) radius, 9.2% of the population is classified as minority, while 15.0% is classified as low income. The number of minority individuals does not exceed 50% of the total population in the area and does not exceed the state average by 20 percentage points or more; thus, in aggregate, there is no minority population in the SEZ area based on 2000 Census data and CEQ guidelines. The number of low-income individuals does not exceed the state average by 20 percentage points or more and does not exceed 50% of the total population in the area; thus, in aggregate, there are no low-income populations in the Utah portion of the SEZ.

Figure 11.4.20.1-1 shows the locations of the low-income population groups within the 50-mi (80-km) radius around the boundary of the SEZ.

At the individual block group level there are low-income populations in only one census block group, in Iron County west of Cedar City (including the towns of Newcastle and Modena), which has a low-income population that is more than 20 percentage points higher than the state average. There are no block groups in the 50-mi (80-km) area with low-income populations that exceed 50% of the total population. The number of minority individuals does not exceed the state average by 20 percentage points or more, or 50% of the total population, in any block group in the 50-mi (80-km) area.

### 11.4.20.2 Impacts

Environmental justice concerns common to all utility-scale solar energy facilities are described in detail in Section 5.18 of the Draft Solar PEIS. The potentially relevant environmental impacts associated with solar facilities within the proposed Dry Lake Valley North SEZ include noise and dust during the construction; noise and EMF associated with operations; visual impacts of solar generation and auxiliary facilities, including transmission lines; access to land used for economic, cultural, or religious purposes; and effects on property values as areas of concern that might potentially affect minority and low-income populations.

Potential impacts on low-income and minority populations could be incurred as a result of the construction and operation of solar facilities involving each of the four technologies. Impacts are likely to be small to moderate; however, there are no minority populations defined by CEQ guidelines (CEQ 1997) (see Section 11.4.20.1 of the Draft Solar PEIS) within the 50-mi (80-km) radius around the boundary of the SEZ. This means that any adverse impacts of solar projects could not disproportionately affect minority populations. Because there are low-income populations within the 50-mi (80-km) radius, there could be impacts on low-income populations.

### 11.4.20.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce potential environmental justice impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will reduce the potential for environmental justice impacts.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for environmental justice have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

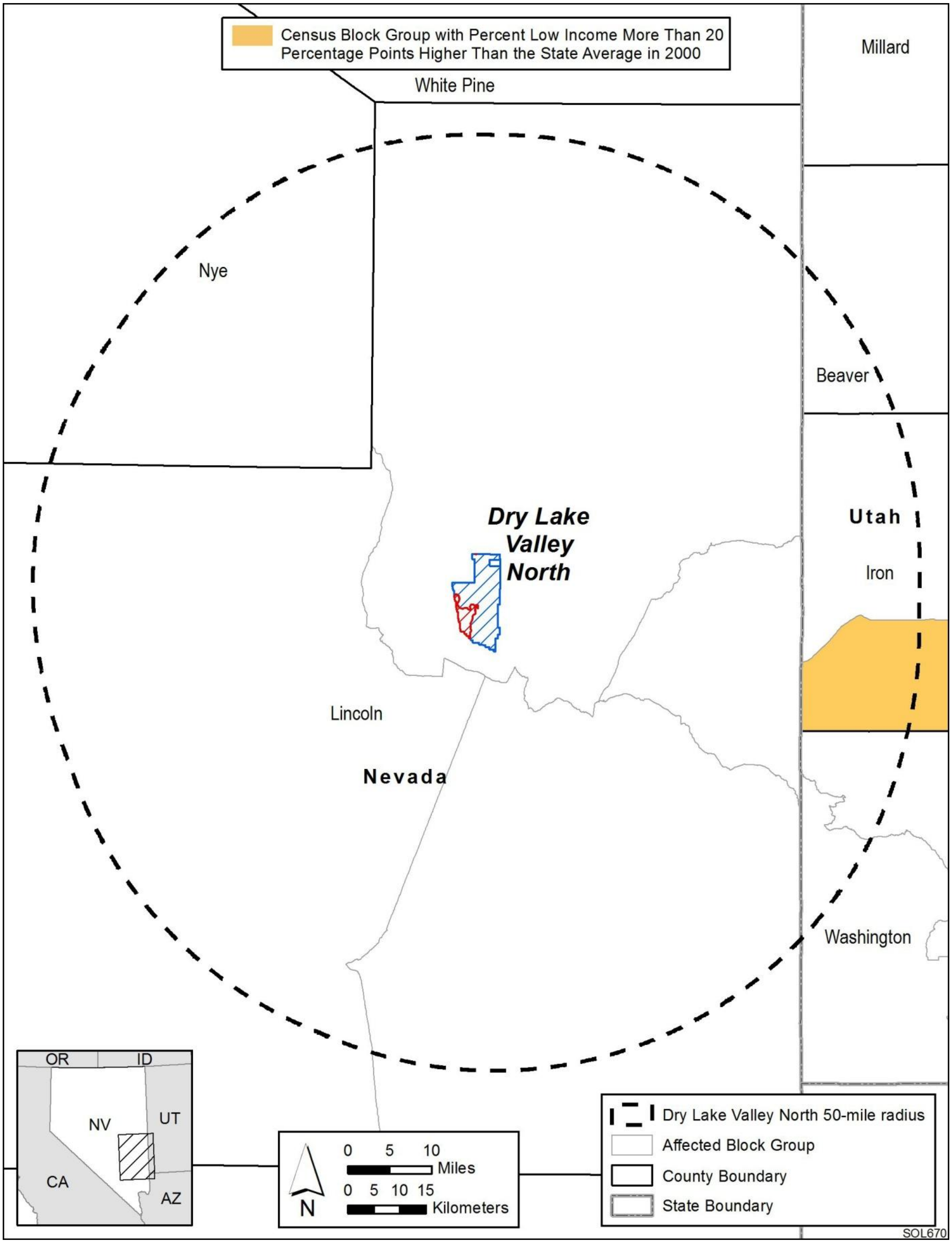


**FIGURE 11.4.20.1-1 Low-Income Population Groups within the 50-mi (80-km) Radius Surrounding the Proposed Dry Lake Valley North SEZ as Revised**

### 11.4.21 Transportation

#### 11.4.21.1 Affected Environment

The reduction in developable area of the proposed Dry Lake Valley North SEZ does not change the information on affected environment provided in the Draft Solar PEIS

#### 11.4.21.2 Impacts

As stated in the Draft Solar PEIS, the primary transportation impacts are anticipated to be from commuting worker traffic. Single projects could involve up to 1,000 workers each day, with an additional 2,000 vehicle trips per day (maximum) or possibly 4,000 vehicle trips per day if two larger projects were to be developed at the same time. The volume of traffic on U.S. 93 would represent an increase in traffic of about a factor of 2 or 4, maximum, in the area of the SEZ for one or two projects, respectively. Because higher traffic volumes would be experienced during shift changes, traffic on either State Route 318 or U.S. 93 could experience moderate slowdowns during these time periods in the general area of the SEZ. Local road improvements would be necessary on State Route 318 or U.S. 93 near any site access point(s).

Solar development within the SEZ would affect public access along OHV routes that are designated open and available for public use. Although open routes crossing areas granted ROWs for solar facilities could be redesignated as closed (see Section 5.5.1 of the Draft Solar PEIS), a programmatic design feature has been included under Recreation (Section A.2.2.6.1 of Appendix A) that requires consideration of replacement of lost OHV route acreage and of access across and to public lands.

#### 11.4.21.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce transportation impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. The programmatic design features, including local road improvements, multiple site access locations, staggered work schedules, and ride-sharing, would all provide some relief to traffic congestion on local roads leading to the SEZ. Depending on the location of solar facilities within the SEZ, more specific access locations and local road improvements could be implemented.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features to address transportation impacts have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.4.22 Cumulative Impacts

The analysis of potential impacts in the vicinity of the proposed Dry Lake Valley North SEZ presented in the Draft Solar PEIS is still generally applicable for this Final Solar PEIS, although the impacts would decrease because the size of the developable area of the proposed SEZ has been reduced to 25,069 acres (116.3 $km^2$). The following sections include an update to the information presented in the Draft Solar PEIS regarding cumulative effects for the proposed Dry Lake Valley North SEZ.

### 11.4.22.1 Geographic Extent of the Cumulative Impact Analysis

The geographic extent of the cumulative impact analysis has not changed. The extent varies on the basis of the nature of the resource being evaluated and the distance at which the impact may occur (e.g., impacts on air quality may have a greater geographic extent than impacts on visual resources). Most of the lands around the SEZ are administered by the BLM, the USFWS, or the DoD. The BLM administers approximately 93.8% of the lands within a 50-mi (80-km) radius of the SEZ.

### 11.4.22.2 Overview of Ongoing and Reasonably Foreseeable Future Actions

The proposed Dry Lake Valley North SEZ decreased from 76,874 acres (116.3 $km^2$), and an additional 3,657 acres (14.8 $km^2$) within the SEZ were identified as non-development areas. The Draft Solar PEIS included six other proposed SEZs in Nevada. Two of these, Delamar Valley and East Mormon Mountain, have been removed from consideration.

There is only one pending ROW application for a solar facility within 50 mi (80 km) of the proposed SEZ. The application is for a 7,680-acre (31-$km^2$), 180-MW power tower facility located about 15 mi (24 km) to the southwest of the SEZ. This solar facility is not currently considered reasonably foreseeable, because there are no firm near-term plans and environmental documentation has not been completed.

#### *11.4.22.2.1 Energy Production and Distribution*

The list of reasonably foreseeable future actions that relate to energy production and distribution, including potential solar energy projects, under the proposed action near the proposed Dry Lake Valley North SEZ has been updated and is presented in Table 11.4.22.2-1. Projects listed in the table are shown in Figure 11.4.22.2-1.

**Wilson Creek Wind Project**

Wilson Creek Wind Company, LLC, proposes to construct and operate a 990-MW wind-powered generation facility on approximately 31,000 acres (125 $km^2$) of land administered by the BLM. The site is located approximately 20 mi (32 km) northeast of Pioche, Nevada, and

**TABLE 11.4.22.2-1 Ongoing and Reasonably Foreseeable Future Actions Related to Energy Development and Distribution near the Proposed Dry Lake Valley North SEZ as Revised[a]**

| Description | Status | Resources Affected | Primary Impact Location |
|---|---|---|---|
| ***Renewable Energy Development*** | | | |
| **Wilson Creek Wind Project 990 W, 32,000 acres** | **NOI May 27, 2011; EIS Public Scoping Summary Report[b]; Project has been terminated** | **Terrestrial habitats, wildlife, recreation, socioeconomics** | **About 23 mi (37 km) northeast of the SEZ** |
| ***Transmission and Distribution Systems*** | | | |
| Southwest Intertie Project | FONSI July 30, 2008; **FEIS January 2010[c]; under construction; expected first operation 2012** | Disturbed areas, terrestrial habitats along transmission line ROW | Corridor passes through the SEZ |
| One Nevada Transmission Line Project | **ROD March 1, 2011[d]** | Disturbed areas, terrestrial habitats along transmission line ROW | Corridor passes through the SEZ |
| Zephyr and Chinook Transmission Line Project | **Permit applications Jan. 28, 2011[e]** | Disturbed areas, terrestrial habitats along transmission line ROW | Corridor passes near or through the SEZ |

a Projects with status changed from that given in the Draft Solar PEIS are shown in bold text.

b See BLM (2011c) for details.

c See Western (2010) for details.

d See BLM (2011d) for details

e See TransCanada (2011) for details.

about 23 mi (37 km) northeast of the SEZ. The project would consist of up to 350 wind turbines (BLM 2011c). The BLM work to process ROW applications for this project has been terminated at the request of the proponents.

### *11.4.22.2.2 Other Actions*

The list of other reasonably foreseeable future actions near the proposed Dry Lake Valley North SEZ has been updated and is presented in Table 11.4.22.2-2.

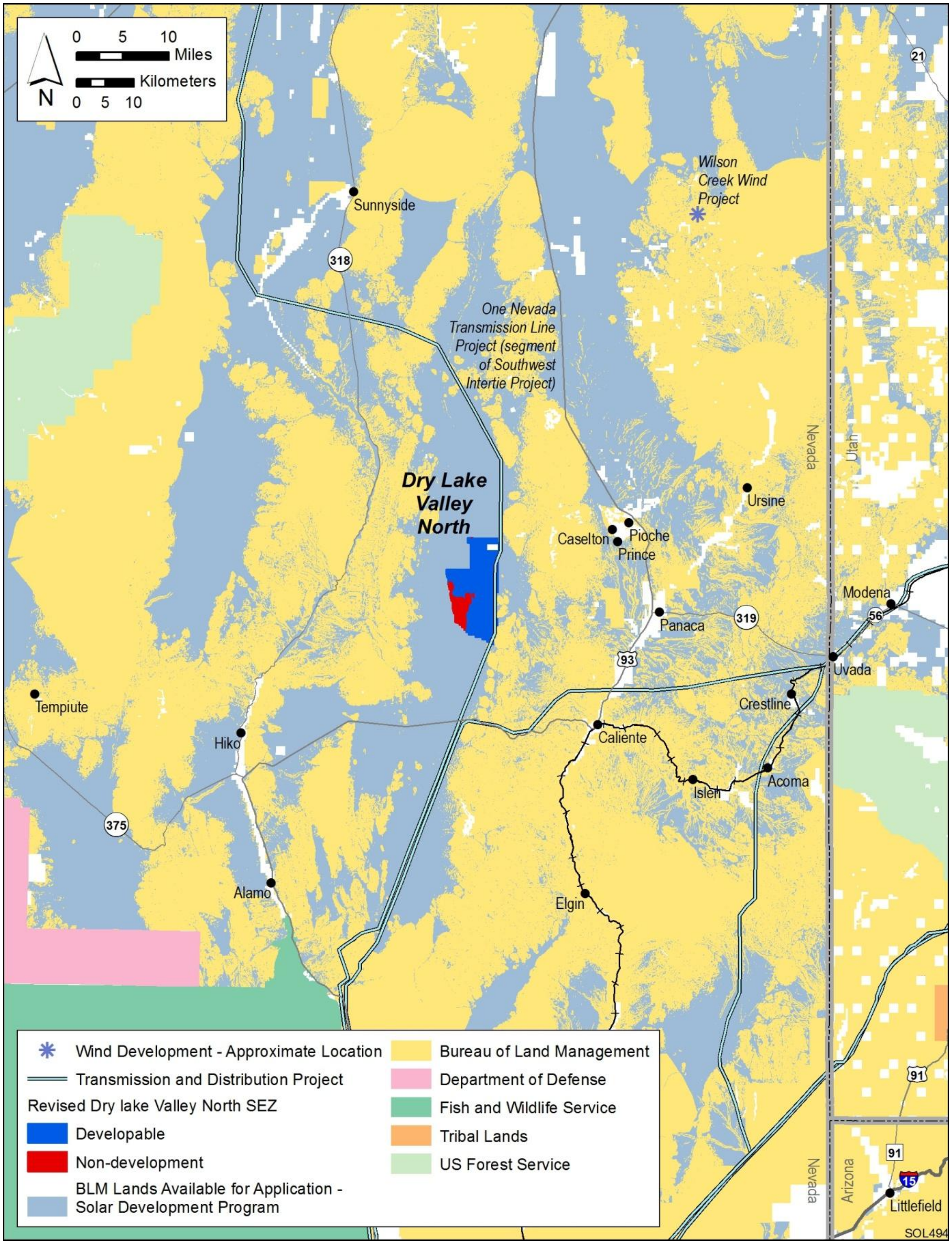


**FIGURE 11.4.22.2-1 Locations of Existing and Reasonably Foreseeable Renewable Energy Projects on Public Land within a 50-mi (80-km) Radius of the Proposed Dry Lake Valley North SEZ as Revised**

**TABLE 11.4.22.2-2 Other Ongoing and Reasonably Foreseeable Actions near the Proposed Dry Lake Valley North SEZ as Revised[a]**

| Description | Status | Resources Affected | Primary Impact Location |
|---|---|---|---|
| Alamo Industrial Park and Community Expansion | Preliminary Design Report January 2000 | Terrestrial habitats, wildlife, socioeconomics | 35 mi[h] southwest of the SEZ |
| Arizona Nevada Tower Corporation Communication Sites | EA April 2007 | Terrestrial habitats, wildlife, cultural resources | East, west, and southwest of the SEZ |
| Ash Canyon Sagebrush Restoration and Fuels Reduction Project | **FONSI July 29, 2010[b]** | Terrestrial habitats, wildlife | 25 mi southeast of the SEZ |
| Caliente Rail Alignment | FEIS June 2008 | Terrestrial habitats, wildlife cultural resources | Passes through the SEZ |
| Clark, Lincoln, and White Pine Counties Groundwater Development Project | **Draft EIS June 2011[c]** A ruling was issued on March 22, 2012, granting SNWA 61,127 ac-ft/yr from Spring Valley and 22,861 ac-ft/yr from Delamar, Dry Lake, and Cave Valleys.[c] | Terrestrial habitats, wildlife, groundwater | Within the SEZ |
| Eagle Herd Management Area Wild Horse Gather | **Completed[d]** | Terrestrial habitats, wildlife | East of the SEZ |
| Lincoln County Land Act Groundwater Development and Utility ROW | Final EIS May 2009; ROD January 2010 | Terrestrial habitats, wildlife, groundwater | Southeast of the SEZ |
| **Meadow Valley Industrial Park** | Completed | Terrestrial habitats, wildlife, socioeconomics | 14 mi southeast of the SEZ |
| NV Energy Microwave and Mobile Radio Project | **FONSI August 27, 2010[e]** | Terrestrial habitats, wildlife cultural resources | Two of the sites are 40 mi west of SEZ; one site is 50 mi northwest of SEZ |
| Patriot Communication Exercises in Lincoln County | **BLM FONSI June 6, 2008[f]; USAF FONSI August 25, 2008[f]** | Terrestrial habitats, wildlife, soils | East, south, and west of the SEZ |

**TABLE 11.4.22.2-2 (Cont.)**

| Description | Status | Resources Affected | Primary Impact Location |
|---|---|---|---|
| Pioche/Caselton Wildland Urban Interface Project | **FONSI July15, 2010**[g] | Terrestrial habitats, wildlife | East of the SEZ |
| Silver King Herd Management Area Wild Horse Gather | **Completed**[d] | Terrestrial habitats, wildlife | In and around the SEZ |
| U.S. 93 Corridor Wild Horse Gather | **Completed**[d] | Terrestrial habitats, wildlife | East of the SEZ |

[a] Projects with status changed from that given in the Draft Solar PEIS are shown in bold text.

[b] See BLM (2010c) for details.

[c] See BLM (2011e) and SNWA (2012b) for details.

[d] See BLM (2012b) for details.

[e] See BLM (2011f) for details.

[f] See USAF (2008) for details.

[g] See BLM (2010d) for details.

[h] To convert mi to km, multiply by 1.6093.

### 11.4.22.3 General Trends

The information on general trends presented in the Draft Solar PEIS remains valid.

### 11.4.22.4 Cumulative Impacts on Resources

Total disturbance in the proposed Dry Lake Valley North SEZ over 20 years is assumed to be about 20,055 acres (81.2 km$^2$) (80% of the developable area of the proposed SEZ). This development would contribute incrementally to the impacts from other past, present, and reasonably foreseeable future actions in the region as described in the Draft Solar PEIS. Primary impacts from development in the Dry Lake Valley North SEZ may include impacts on water quantity and quality, air quality, ecological resources such as habitat and species, cultural and visual resources, and specially designated lands.

Activities in the region that will contribute to cumulative impacts include one additional project within 50 mi (80 km) of the Dry Lake Valley North SEZ that was not considered foreseeable at the time the Draft Solar PEIS was prepared: the Wilson Creek Wind Project (990 MW). This project was identified in Table 11.4.22.2-2 of the Draft Solar PEIS as pending development.

Overall, the incremental cumulative impacts associated with development in the proposed Dry Lake Valley North SEZ during construction, operation, and decommissioning are expected to be the same as or less than those discussed in the Draft Solar PEIS. This is because the size of the Dry Lake Valley North SEZ has decreased by more than half from that presented in the Draft Solar PEIS, thereby reducing the incremental contribution to cumulative impacts from the SEZ.

## 11.4.23 Transmission Analysis

The methodology for this transmission analysis is described in Appendix G of this Final Solar PEIS. This section presents the results of the transmission analysis for the Dry Lake Valley North SEZ, including the identification of potential load areas to be served by power generated at the SEZ and the results of the DLT analysis. Unlike Sections 11.4.2 through 11.4.22, this section is not an update of previous analysis for the Dry Lake Valley North SEZ; this analysis was not presented in the Draft Solar PEIS. However, the methodology and a test case analysis were presented in the Supplement to the Draft Solar PEIS. Comments received on the material presented in the Supplement were used to improve the methodology for the assessment presented in this Final Solar PEIS.

The Dry Lake Valley North SEZ represents one of the more complex cases because of its potential to generate a large amount of solar power. On the basis of its size, the assumption of a minimum of 5 acres (0.02 $km^2$) of land required per MW, and the assumption of a maximum of 80% of the land area developed, the Dry Lake Valley North SEZ is estimated to have the potential to generate 4,011 MW of marketable solar power at full build-out.

### 11.4.23.1 Identification and Characterization of Load Areas

The primary candidates for Dry Lake Valley North SEZ load areas are the major surrounding cities. Figure 11.4.23.1-1 shows the possible load areas for the Dry Lake Valley North SEZ and the estimated portion of their market that could be served by solar generation. Possible load areas for the Dry Lake Valley North SEZ include Phoenix and Tucson, Arizona; Salt Lake City, Utah; Las Vegas and Reno, Nevada; and San Diego, Los Angeles, San Jose, San Francisco, Oakland, and Sacramento, California.

The two load area groups examined for the Dry Lake Valley North SEZ are as follows:

1. Los Angeles, California; and

2. Reno, Nevada; Sacramento, Oakland, San Francisco, and San Jose, California; Salt Lake City, Utah; and Phoenix, Arizona.

Figure 11.4.23.1-2 shows the most economically viable load groups and transmission scheme for the Dry Lake Valley North SEZ (transmission scheme 1), and Figure 11.4.23.1-3 shows an alternative transmission scheme (transmission scheme 2) that represents a logical choice should transmission scheme 1 be infeasible. As described in Appendix G, the alternative


**FIGURE 11.4.23.1-1 Location of the Proposed Dry Lake Valley North SEZ and Possible Load Areas (Source for background map: Platts 2011)**

shown in transmission scheme 2 represents the optimum choice if one or more of the primary linkages in transmission scheme 1 are excluded from consideration. The groups provide for linking loads along alternative routes so that the SEZ's output of 4,011 MW could be fully allocated.

Table 11.4.23.1-1 summarizes and groups the load areas according to their associated transmission scheme and provides details on how the megawatt load for each area was estimated.

### 11.4.23.2 Findings for the DLT Analysis

The DLT analysis approach assumes that the Dry Lake Valley North SEZ will require all new construction for transmission lines (i.e., dedicated lines) and substations. The new transmission lines(s) would directly convey the 4,011-MW output of the Dry Lake Valley North SEZ to the prospective load areas for each possible transmission scheme. The approach also assumes that all existing transmission lines in the WECC region are saturated and have little or no available capacity to accommodate the SEZ's output throughout the entire 10-year study horizon.

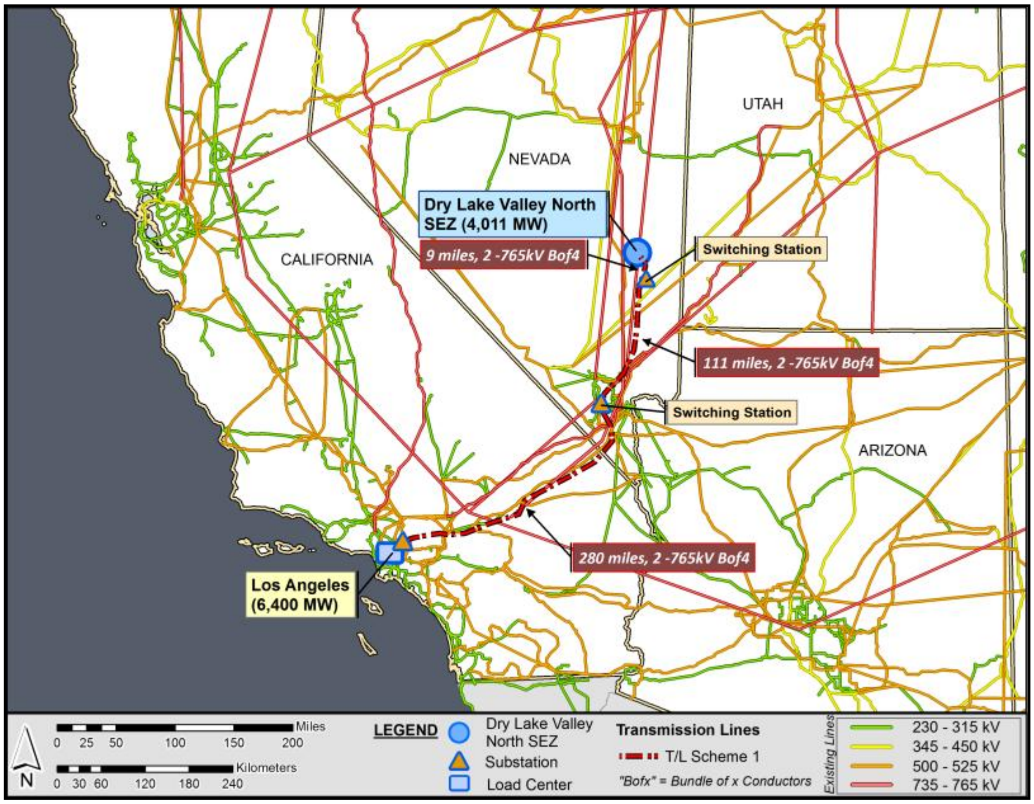


**FIGURE 11.4.23.1-2 Transmission Scheme 1 for the Proposed Dry Lake Valley North SEZ (Source for background map: Platts 2011)**

Figures 11.4.23.1-2 and 11.4.23.1-3 display the pathways that new dedicated lines might follow to distribute solar power generated at the Dry Lake Valley North SEZ via the two identified transmission schemes described in Table 11.4.23.1-1. These pathways parallel existing 500-kV, 345-kV, and/or lower voltage lines. The intent of following existing lines is to avoid pathways that may be infeasible due to topographical limitations or other concerns.

For transmission scheme 1, a new line would be constructed to connect with Los Angeles (6,400 MW), so that the 4,011-MW output of the Dry Lake Valley North SEZ could be fully utilized (Figure 11.4.23.1-2). This particular scheme has three segments. The first segment extends about 9 mi (14 km) from the SEZ to the first switching station. On the basis of engineering and operational considerations, this segment would require a double-circuit 765-kV (2–765 kV) bundle of four conductors (Bof4) transmission line design. The second segment is about 111 mi (179 km) long and runs from the first switching station to the second switching station located in Las Vegas. The third and final segment goes to Los Angeles, traversing a distance of about 280 mi (451 km). In general, the transmission configuration options were determined by using the line "loadability" curve provided in American Electric Power's *Transmission Facts* (AEP 2010). Appendix G documents the line options used for this analysis and describes how the load area groupings were determined.


**FIGURE 11.4.23.1-3 Transmission Scheme 2 for the Proposed Dry Lake Valley North SEZ (Source for background map: Platts 2011)**

For transmission scheme 2, serving load centers to the northwest, northeast, and southwest, Figure 11.4.23.1-3 shows that new lines would be constructed to the northwest to connect with Reno (213 MW), Sacramento (1,075 MW), San Francisco (400 MW), Oakland (195 MW), and San Jose (480 MW), so that the 4,011-MW output of the Dry Lake Valley North SEZ could be fully utilized. This scheme would also require construction of a new line extending from Las Vegas to the southeast to Phoenix and another new line to the northeast to Salt Lake City. This scheme has a total of nine segments. The first segment extends 9 mi (14 km) from the SEZ to the first switching station. On the basis of engineering and operational considerations, this segment would require a double-circuit 765-kV (2–765 kV) line with a bundle of four (Bof4) conductors transmission line design. The second segment is about 111 mi (179 km) long and runs from the first switching station to the second switching station located in Las Vegas. This segment would likewise require a double-circuit 765-kV line (2–765 kV) with a bundle of four conductors. The third segment extends to the northwest from Las Vegas to Reno over a distance of 385 mi (620 km). A line configuration consisting of a double-circuit, 765-kV bundle of four is required for this segment. The fourth segment goes from Reno 104 mi (167 km) to the third switching station near Sacramento. This segment would have a line design consisting of a double-circuit 500-kV (2–500kV) line with a bundle of three (Bof3) conductors. The fifth segment extends 23 mi (37 km) and joins the switching station with Sacramento. This segment would require a double-circuit 345-kV (2–345 kV) line with a bundle of two conductors. The sixth, seventh, and eighth segments extend to serve the cities of Oakland, San Francisco, and

**TABLE 11.4.23.1-1 Candidate Load Area Characteristics for the Proposed Dry Lake Valley North SEZ**

| Transmission Scheme | City/Load Area Name | Position Relative to SEZ | 2010 Population[c] | Estimated Total Peak Load (MW) | Estimated Peak Solar Market (MW) |
|---|---|---|---|---|---|
| 1 | Los Angeles, California[a] | Southwest | 12,800,000 | 32,000 | 6,400 |
| 2 | Las Vegas, Nevada[a] | Southwest | 1,950,000 | 4,875 | 975 |
| | Reno, Nevada[a] | Northwest | 425,000 | 1,063 | 213 |
| | Sacramento, California[a] | Northwest | 2,150,000 | 5,375 | 1,075 |
| | Oakland, California[b] | West | 390,000 | 975 | 195 |
| | San Francisco, California[b] | West | 800,000 | 2,000 | 400 |
| | San Jose, California[b] | West | 960,000 | 2,400 | 480 |
| | Phoenix, Arizona[b] | Southwest | 1,400,000 | 3,500 | 700 |
| | Salt Lake City, Utah[a] | Northeast | 1,124,000 | 2,810 | 562 |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

[c] City and metropolitan area population data are from 2010 Census data (U.S. Bureau of the Census 2010).

San Jose, over distances of 98 mi (158 km), 12 mi (19 km), and 40 mi (64 km), respectively. The required configuration would be 2–345 kV Bof2, 1–345 kV Bof2, and 1–345 kV Bof2, respectively. The ninth segment connects with Salt Lake City, covering a distance of about 387 mi (623 km), and uses a 1–230 kV Bof1 configuration. The tenth and final segment goes to Phoenix from Las Vegas, traversing a distance of about 294 mi (473 km). This segment would require a 2–345 kV Bof2 line configuration.

Table 11.4.23.2-1 summarizes the distances to the various load areas over which new transmission lines would need to be constructed, as well as the assumed number of substations that would be required. One substation is assumed to be installed at each load area and an additional one at the SEZ. Thus, in general, the total number of substations per scheme is simply equal to the number of load areas associated with the scheme plus one. Substations at the load areas would consist of one or more step-down transformers, while the originating substation at the SEZ would consist of several step-up transformers. The originating substation would have a rating of at least 4,011 MW (to match the plant's output), while the combined load substations would have a similar total rating of 4,011 MW. For schemes that require branching of the lines, a switching substation is assumed to be constructed at the appropriate junction. In general, switching stations carry no local load but are assumed to be equipped with switching gears (e.g., circuit breakers and connecting switches) to reroute power as well as, in some cases, with additional equipment to regulate voltage.

**TABLE 11.4.23.2-1 Potential Transmission Schemes, Estimated Solar Markets, and Distances to Load Areas for the Proposed Dry Lake Valley North SEZ**

| Transmission Scheme | City/Load Area Name | Estimated Peak Solar Market (MW)[c] | Total Solar Market (MW) | Sequential Distance (mi)[d] | Total Distance (mi)[d] | Line Voltage (kV) | No. of Substations |
|---|---|---|---|---|---|---|---|
| 1 | Los Angeles, California[a] | 6,400 | 6,400 | 400 | 400 | 765 | 4 |
| 2 | Las Vegas, Nevada[a] | 975 | 4,600 | 120 | 1,463 | 765, 500, 345, 230 | 11 |
| | Reno, Nevada[a] | 213 | | 385 | | | |
| | Sacramento, California[a] | 1,075 | | 127 | | | |
| | San Francisco, California[b] | 400 | | 12 | | | |
| | Oakland, California[b] | 195 | | 98 | | | |
| | San Jose, California[b] | 480 | | 40 | | | |
| | Phoenix, Arizona[b] | 700 | | 294 | | | |
| | Salt Lake City, Utah[a] | 562 | | 387 | | | |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

[c] From Table 11.4.23.1-1.

[d] To convert mi to km, multiply by 1.6093.

Table 11.4.23.2-2 provides an estimate of the total land area disturbed for construction of new transmission facilities under each of the schemes evaluated. The most favorable transmission scheme with respect to minimizing costs and the area disturbed would be scheme 1, which would serve Los Angeles. This scheme is estimated to potentially disturb about 9,986 acres (40.4 km$^2$) of land. The less favorable transmission scheme with respect to minimizing costs and the area disturbed would be scheme 2, which serves Las Vegas, multiple load areas in California, and Phoenix. For this scheme, the construction of new transmission lines and substations is estimated to disturb a land area on the order of 31,916 acres (129.2 km$^2$).

Table 11.4.23.2-3 shows the estimated NPV of both transmission schemes and takes into account the cost of constructing the lines, the substations, and the projected revenue stream over the 10-year horizon. A positive NPV indicates that revenues more than offset investments. This calculation does not include the cost of producing electricity.

The most economically attractive configuration (transmission scheme 1) has the highest positive NPV and serves Los Angeles. The secondary case (transmission scheme 2), which excludes one or more of the primary pathways used in scheme 1, is less economically attractive and includes the Reno, Sacramento, San Francisco, San Jose, Oakland, Salt Lake City, and

**TABLE 11.4.23.2-2 Comparison of the Various Transmission Line Configurations with Respect to Land Use Requirements for the Proposed Dry Lake Valley North SEZ**

| Transmission Scheme | City/Load Area Name | Total Distance (mi)[c] | No. of Substations | Land Use (acres)[d] Transmission Line | Substation | Total |
|---|---|---|---|---|---|---|
| 1 | Los Angeles, California[a] | 400 | 4 | 9,697.0 | 288.6 | 9,985.6 |
| 2 | Las Vegas, Nevada[a]<br>Reno, Nevada[a]<br>Sacramento, California[a]<br>San Francisco, California[b]<br>Oakland, California[b]<br>San Jose, California[b]<br>Phoenix, Arizona[b]<br>Salt Lake City, Utah[a] | 1,463 | 11 | 31,670 | 246.1 | 31,916 |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

[c] To convert mi to km, multiply by 1.6093.

[d] To convert acres to $km^2$, multiply by 0.004047.

Phoenix markets. For the assumed utilization factor of 20%, both options exhibit positive NPVs, implying varying degrees of economic viability under the current assumptions.

Table 11.4.23.2-4 shows the effect of varying the value of the utilization factor on the NPV of the transmission schemes. It also shows that as the utilization factor is increased, the economic viability of the lines also increases. Utilization factors can be raised by allowing the new dedicated lines to market other power generation outputs in the region in addition to that of its associated SEZ.

The findings of the DLT analysis for the proposed Dry Lake Valley North SEZ are as follows:

- Transmission scheme 1, which identifies Los Angeles as the primary market, represents the most favorable option based on NPV and land use requirements. This configuration would result in new land disturbance of about 9,986 acres (40.4 $km^2$).

- Transmission scheme 2 represents an alternative configuration and serves Las Vegas, multiple load areas in California, Salt Lake City, and Phoenix. This configuration would result in new land disturbance of about 31,916 acres (129.2 $km^2$).

**TABLE 11.4.23.2-3 Comparison of Potential Transmission Lines with Respect to NPV (Base Case) for the Proposed Dry Lake Valley North SEZ**

| Transmission Scheme | City/Load Area Name | Present Value Transmission Line Cost ($ million) | Present Value Substation Cost ($ million) | Annual Sales Revenue ($ million) | Present Worth of Revenue Stream ($ million) | NPV ($ million) |
|---|---|---|---|---|---|---|
| 1 | Los Angeles, California[a] | 2,250.0 | 264.7 | 702.7 | 5,426.3 | 2,911.5 |
| 2 | Las Vegas, Nevada[a]<br>Reno, Nevada[a]<br>Sacramento, California[a]<br>San Francisco, California[b]<br>Oakland, California[b]<br>San Jose, California[b]<br>Phoenix, Arizona[b]<br>Salt Lake City, Utah[a] | 4,861.3 | 264.7 | 702.7 | 5,426.3 | 300.2 |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

**TABLE 11.4.23.2-4 Effects of Varying the Utilization Factor on the NPV of the Transmission Schemes for the Proposed Dry Lake Valley SEZ**

| Transmission Scheme | City/Load Area Name | NPV ($ million) at Different Utilization Factors | | | | | |
|---|---|---|---|---|---|---|---|
| | | 20% | 30% | 40% | 50% | 60% | 70% |
| 1 | Los Angeles, California[a] | 2,911.6 | 5,624.7 | 8,337.8 | 11,051.0 | 13,764.1 | 16,477.2 |
| 2 | Las Vegas, Nevada[a]<br>Reno, Nevada[a]<br>Sacramento, California[a]<br>San Francisco, California[b]<br>Oakland, California[b]<br>San Jose, California[b]<br>Phoenix, Arizona[b]<br>Salt Lake City, Utah[a] | 300.2 | 3,013.3 | 5,726.5 | 8,439.6 | 11,152.8 | 13,865.9 |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

- Other load area configurations are possible but would be less favorable than scheme 1 in terms of NPV and, in most cases, also in terms of land use requirements. If new electricity generation at the proposed Dry Lake Valley North SEZ is not sent to either of the two markets identified above, the potential upper-bound impacts in terms of cost would be greater.

- The analysis of transmission requirements for the proposed Dry Lake Valley North SEZ indicates no reduction of impacts from increasing the solar-eligible load assumption for transmission scheme 1, which brings power to Los Angeles. Increasing the solar-eligible percentage would have no effect, because an adequate load area was identified under the 20% assumption that would accommodate all of the SEZ's capacity. Thus, line distances and voltages would not be affected by increasing the solar-eligible load assumption, and similarly the associated costs and land disturbance would not be affected. However, for transmission scheme 2, which serves Las Vegas, multiple load areas in California, Salt Lake City, and Phoenix, increasing the solar-eligible load assumption could result in significantly lower cost and land disturbance estimates, because it is likely that fewer load areas would be needed to accommodate the SEZ's capacity.

### 11.4.24 Impacts of the Withdrawal

The BLM is proposing to withdraw 28,726 acres (117 $km^2$) of public land comprising the proposed Dry Lake Valley North SEZ from settlement, sale, location, or entry under the general land laws, including the mining laws, for a period of 20 years (see Section 2.2.2.2.4 of this Final Solar PEIS). The public lands would be withdrawn, subject to valid existing rights, from settlement, sale, location, or entry under the general land laws, including the mining laws. This means that the lands could not be appropriated, sold, or exchanged during the term of the withdrawal and new mining claims could not be filed on the withdrawn lands. Mining claims filed prior to the segregation or withdrawal of the identified lands would take precedence over future solar energy development. The withdrawn lands would remain open to the mineral leasing, geothermal leasing, and mineral material laws, and the BLM could elect to lease the oil, gas, coal, or geothermal steam resources, or to sell common-variety mineral materials, such as sand and gravel, contained in the withdrawn lands. In addition, the BLM would retain the discretion to authorize linear and renewable energy ROWs on the withdrawn lands.

The purpose of the proposed land withdrawal is to minimize the potential for conflicts between mineral development and solar energy development for the proposed 20-year withdrawal period. Under the land withdrawal, there would be no mining-related surface development, such as the establishment of open-pit mining, construction of roads for hauling materials, extraction of ores from tunnels or adits, or construction of facilities to process the material mined, that could preclude use of the SEZ for solar energy development. For the Dry Lake Valley North SEZ, the impacts of the proposed withdrawal on mineral resources and related economic activity and employment are expected to be negligible, because the mineral potential of the lands within the SEZ is low (BLM 2012a). There has been no documented mining within the SEZ, and there are no known locatable mineral deposits within the land withdrawal area. According to the LR2000 (accessed in May 2012), there are no recorded mining claims within the land withdrawal area.

Although the mineral potential of the lands within the Dry Lake Valley North SEZ is low, the proposed withdrawal of lands within the SEZ would preclude many types of mining activity over a 20-year period, resulting in the avoidance of potential mining-related impacts. Impacts commonly related to mining development include increased soil erosion and sedimentation, water use, generation of contaminated water in need of treatment, creation of lagoons and ponds (hazardous to wildlife), toxic runoff, air pollution, establishment of noxious weeds and invasive species, habitat destruction or fragmentation, disturbance of wildlife, blockage of migration corridors, increased visual contrast, noise, destruction of cultural artifacts and fossils and/or their context, disruption of landscapes and sacred places of interest to tribes, increased traffic and related emissions, and conflicts with other land uses (e.g., recreational).

### 11.4.25 References

*Note to Reader:* This list of references identifies Web pages and associated URLs where reference data were obtained for the analyses presented in this Final Solar PEIS. It is likely that at the time of publication of this Final Solar PEIS, some of these Web pages may no longer be available or the URL addresses may have changed. The original information has been retained and is available through the Public Information Docket for this Final Solar PEIS.

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BLM, 2010a, *Wild Horse and Burro Statistics and Maps*. Available at http://www.blm.gov/wo/st/en/prog/wild_horse_and_burro/wh_b_information_center/statistics_and_maps/ha_and_hma_data.html. Accessed June 25, 2010.

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## 11.4.26 Errata for the Proposed Dry Lake Valley North SEZ

This section presents corrections to material presented in the Draft Solar PEIS and the Supplement to the Draft. The need for these corrections was identified in several ways: through comments received on the Draft Solar PEIS and the Supplement to the Draft (and verified by the authors), through new information obtained by the authors subsequent to publication of the Draft Solar PEIS and Supplement to the Draft, or through additional review of the original material by the authors. Table 11.4.26-1 provides corrections to information presented in the Draft Solar PEIS and the Supplement to the Draft.

**TABLE 11.4.26-1 Errata for the Proposed Dry Lake Valley North SEZ (Section 11.4 of the Draft Solar PEIS and Section C.4.3 of the Supplement to the Draft Solar PEIS)**

| Section No. | Page No. | Line No. | Figure No. | Table No. | Correction |
|---|---|---|---|---|---|
| 11.4.2.1 | 11.4-19 | 14 | | | The reference to "U.S. 95" should be to "U.S. 93." |
| 11.4.9.1.3 | 11.4-63 | 11–13 | | | "This amount of water represents the remaining amount of unappropriated water within the Dry Lake Valley Basin, less 50 ac-ft/yr that would be reserved for future use within the basin," should read, "Rulings 5875 and 5993 result in the Dry Lake Valley groundwater basin being fully allocated with 50 ac-ft/yr being reserved for future use." |
| 11.4.9.2.4 | 11.4-68 | 29–30 | | | "The NDWR (2008) has declared that there are 11,584 ac-ft (14 million m3/yr) of water available annually in the basin for beneficial uses," should read, "The NDWR set the perennial yield to 12,700 ac-ft/yr (15.7 million $m^3$/yr), with 11,584 ac-ft/yr (14 million $m^3$/yr) being allocated to the SNWA." |
| 11.4.9.2.4 | 11.4-68 | 38–46 | | | This paragraph describing a solar development scenario based on a limitation of 11,584 ac-ft/yr should be ignored. While this was a hypothetical analysis, its basis on the SNWA's water allocation that is under review is not an appropriate value representing available water in Dry Lake Valley. |
| 11.4.11.2 | | | | | All uses of the term "neotropical migrants" in the text and tables of this section should be replaced with the term "passerines." |
| 11.4.17.1.3 | 11.4.259 | 33–42 | | | This text should read "It was necessary to construct intrastate rail lines to move ore from mines to mills; the Pioche to Bullionville Railroad had been the closest line to the proposed SEZ before it was discontinued, but interstate railroads were also critical to the development of the economy. The San Pedro-Los Angeles-Salt Lake Railroad was constructed in 1905, connecting two of the most populous cities in the American West. This still-used rail line is located to the east of the proposed Dry Lake Valley North SEZ. The infamous Transcontinental Railroad was constructed between 1863 and 1869, connecting Sacramento, California, and Omaha, Nebraska, passing through the Nevada towns of Reno, Wadsworth, Winnemucca, Battle Mountain, Elko, and Wells on its way to changing the manner in which people traversed the United States." |

**TABLE 11.4.26-1 (Cont.)**

| Section No. | Page No. | Line No. | Figure No. | Table No. | Correction |
|---|---|---|---|---|---|
| 11.4.21.1 | 11.4-303 | 23 | | | The sentence "The railroad has a stop along this route in Caliente, 25 mi (40 km) south of Pioche on U.S. 93." should read, "The nearest rail access along this route is in Caliente, 25 mi (40 km) south of Pioche on U.S. 93." |
| | 11.4-305 | | 11.4.21.1-1 | | The railroad shown in Figure 11.4.21.1-1 between Caliente and Prince in the Draft Solar EIS should be removed from the figure as this spur rail line is no longer operational. |
| 11.4.22 | 11.4-307 | 16 | | | The estimate of population for the Castleton and Pioche areas of 2,111 in the Draft Solar PEIS may be too high. The Nevada State Demographer lists only 836 persons in Pioche in 2009 and does not even provide an estimate of population for Castleton given its very small size (perhaps 1 to 2 dozen homes) (http://nvdemography.org/ data-and-publications/estimates/estimates-by-county-city-andunincorporated-towns/). The word "few" should be replaced with "no," regarding the number of persons residing in Dry Lake Valley. |
| 11.4.22.2.2 | 11.4-314 | 27 | | | The word "Count" should be "County." |
| 11.4.22.2.2 | 11.4-316 | 11 | | | "and western Utah" should be removed from the following statement: *Clark, Lincoln, and White Pine Counties Groundwater Development Project.* The Southern Nevada Water Authority (SNWA) proposes to construct a groundwater development project that would transport approximately 122,755 ac-ft/yr (151 million $m^3$/yr) of groundwater under existing water rights and applications from several hydrographic basins in eastern Nevada and western Utah. |
| 11.4.22.2.2 | 11.4-316 | 36-44 | | | The text should indicate that only one of the four parcels was planned for transfer to Lincoln County and the County purchased said parcel from the BLM 3 years ago. One of the other parcels was sold at auction to a private party 2 years ago. |

**TABLE 11.4.26-1 (Cont.)**

| Section No. | Page No. | Line No. | Figure No. | Table No. | Correction |
|---|---|---|---|---|---|
| 11.4.22.3.3 | 11.4-320 | 3-7 | | | The current text should be replaced with: "However, this water right allocation has been vacated upon judicial review, and the SNWA Dry Lake Valley applications will be reconsidered by NDWR. Concerned parties and the SNWA could present new information about the groundwater basin, and thus the NDWR could alter its previous assessment of water availability in the basin." |

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## 11.5 EAST MORMON MOUNTAIN

As stated at the beginning of this chapter, the East Mormon Mountain SEZ was dropped from further consideration through the Supplement to the Draft Solar PEIS. This section presents the information (with minor updates) provided in Appendix B of the Supplement to the Draft Solar PEIS on the rationale for dropping this SEZ.

### 11.5.1 Summary of Potential Impacts Identified in the Draft Solar PEIS

The proposed East Mormon Mountain SEZ, as presented in the Draft Solar PEIS, had a total area of 8,968 acres (36 $km^2$). It is located in Lincoln County in southern Nevada (Figure 11.5.1-1). The nearest towns are the cities of Mesquite and Bunkerville, approximately 13 mi (21 km) southeast and south–southeast of the SEZ, respectively.

The Draft Solar PEIS also identified I-15, about 11 mi (18 km) southeast of the SEZ, as the nearest major road and assumed that a new access road would be constructed from the proposed SEZ to I-15 to support development.

Potential environmental and other impacts identified in the Draft Solar PEIS included the following:

- Solar development could sever existing roads and trails that access the SEZ and make it difficult to access undeveloped public lands within and to the west of the SEZ.

- Visual impacts of solar energy development would have the potential to affect wilderness characteristics of the Mormon Mountains WA. A new access road would pass through the Mormon Mountain ACEC, causing fragmentation of the ACEC.

- If full solar development would occur in the SEZ, the Gourd Springs allotment would be reduced in area by about 9.1%. Because the SEZ would occupy the best grazing land in the allotment, it is likely that the grazing operation would become economically infeasible and all 3,458 AUMs currently authorized would be lost.

- There may be some loss of wilderness recreational opportunities in up to 9.7% of the Mormon Mountains WA.

- The DoD indicated that solar technologies with structures higher than 200 ft (61 m) would intrude into military airspace and would present safety concerns for military aircraft.

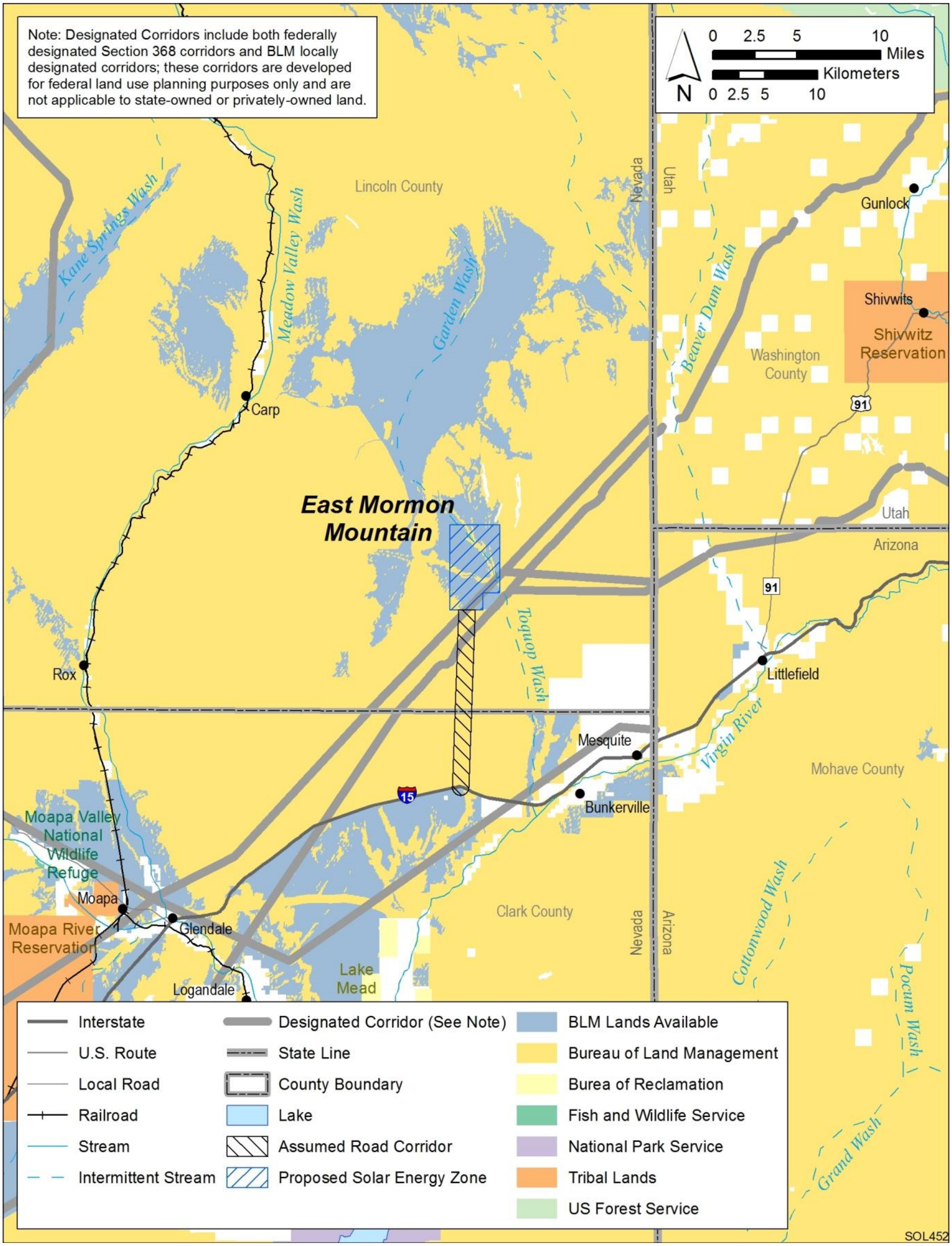


**FIGURE 11.5.1-1 Proposed East Mormon Mountain SEZ as Presented in the Draft Solar PEIS**

- Impacts on soil resources (e.g., soil compaction, soil horizon mixing, soil erosion by wind and runoff, sedimentation, and soil contamination) could occur.

- Groundwater use would deplete the aquifer to the extent that, at a minimum, wet-cooling options would not be feasible.

- Clearing of a large portion of the proposed SEZ could primarily affect playa habitats, riparian habitats, desert dry washes, or other intermittently flooded areas within or downgradient from solar projects, depending on the amount of habitat disturbed. The establishment of noxious weeds could result in habitat degradation. Deposition of fugitive dust could cause reduced productivity or changes in plant community structure.

- Potentially suitable habitat for 32 special status species occurs in the affected area of the proposed SEZ; less than 1.0% of the potentially suitable habitat for any of these species and any wildlife species occurs in the region that would be directly affected by development.

- If aquatic biota are present, they could be affected by the direct removal of surface water features within the construction footprint, a decline in habitat quantity and quality due to water withdrawals and changes in drainage patterns, as well as increased sediment and contaminant inputs associated with ground disturbance and construction activities.

- Temporary exceedances of ambient air quality standards for particulate matter at the SEZ boundaries are possible during construction. These high concentrations, however, would be limited to the immediate area surrounding the SEZ boundary.

- Although the SEZ is in an area of low scenic quality, strong visual contrasts could be observed by visitors to the Mormon Mountains WA.

- Few, if any, impacts on significant paleontological resources are likely to occur in the proposed SEZ. Areas near Toquop Wash and South Fork have considerable potential for containing significant sites; thus, direct impacts on significant cultural resources could occur in the proposed SEZ. Visual impacts on the Old Spanish National Historic Trail are possible, as well as visual and auditory effects on nearby rock art sites. The proposed SEZ does include plants and animals traditionally important to Native Americans.

### 11.5.2 Summary of Comments Received

Most of the comments received on the proposed East Mormon Mountain SEZ were in favor of eliminating the area as an SEZ (N-4 State Grazing Board; Lincoln County, Nevada; and the WWP). However, the Nevada Wilderness Project and The Wilderness Society et al.[1] supported designating the area as an SEZ. Many comments expressed concern for ranching operations in the area and the effect of solar development in the proposed SEZ on grazing allotments in the area.

The DoD recommended that any solar energy technologies that require structures higher than 700 ft (1,127 m) AGL receive additional analysis. Lincoln County opposed designation of the East Mormon Mountain as an SEZ because of its potential adverse impacts on the Mormon Mesa ACEC, especially designated lands with wilderness characteristics and designated by Congress, livestock grazing, recreation, DoD operating areas, sensitive soil, water and vegetation resources, designated critical habitat for federally endangered species, and visual resource values.

The WWP recommended eliminating the East Mormon Mountain as an SEZ, because it includes desert tortoise habitat and is immediately adjacent to the Mormon Mesa Desert Wildlife Management Area (DWMA) and the Beaver Dam Slope DWMA in the Northeastern Mojave recovery unit. The Nature Conservancy recommended avoiding the Toquop Wash, because it is a regionally important desert wash containing many of the Mojave Desert ecoregionally significant plant and animal species.

An ethnographic study for the proposed East Mormon Mountain SEZ area was recently conducted (SWCA and University of Arizona 2011), and a summary of that study was presented in the Supplement to the Draft Solar PEIS. The agencies value the information shared by the tribes during the ethnographic study and will consider their input in striving to minimize the impacts of solar development. The completed ethnographic study is available in its entirety on the Solar PEIS Web site (http://solareis.anl.gov).

### 11.5.3 Rationale for Eliminating the SEZ

On the basis of public comments received on the Draft Solar PEIS, review by the BLM, and continued review of potential impacts identified in the Draft Solar PEIS, the East Mormon Mountain SEZ was eliminated from further consideration and will not be identified as an SEZ in applicable land use plans. The potential impacts from solar development in the proposed East Mormon Mountain SEZ were considered sufficient reason to eliminate the area from further consideration.

Although the area has been dropped from consideration as an SEZ, the lands that composed the proposed East Mormon Mountain SEZ will be retained as solar ROW variance areas, because the BLM expects that individual projects could be sited in this area to avoid

[1] The Wilderness Society, Center for Biological Diversity, Defenders of Wildlife, Sierra Club–Toiyabe Chapter, National Parks Conservation Association, Natural Resources Defense Council, Soda Mountain Wilderness Council, and Sierra Trek submitted joint comments on the proposed Nevada SEZs. Those comments are attributed to The Wilderness Society et al.

and/or minimize impacts. Any solar development within this area in the future would require appropriate environmental analysis.

## 11.5.4 References

*Note to Reader:* This list of references identifies Web pages and associated URLs where reference data were obtained for the analyses presented in this Final Solar PEIS. It is likely that at the time of publication of this Final Solar PEIS, some of these Web pages may no longer be available or their URL addresses may have changed. The original information has been retained and is available through the Public Information Docket for this Final Solar PEIS.

SWCA and University of Arizona (SWCA Environmental Consultants and Bureau of Applied Research in Anthropology), 2011, *Ethnographic and Class I Records Searches for Proposed Solar Energy Zones in California, Nevada, and Utah for the Bureau of Land Management's Solar Programmatic Environmental Impact Statement*, prepared by SWCA Environmental Consultants, Albuquerque, N.M., and Bureau of Applied Research in Anthropology, University of Arizona, Tucson, Ariz., Dec.

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# 11.6 GOLD POINT

## 11.6.1 Background and Summary of Impacts

### 11.6.1.1 General Information

The proposed Gold Point SEZ is located in Esmeralda County in southwestern Nevada. In 2008, the county population was 664, while adjacent Nye County to the east had a population of 44,175. No incorporated towns are in close proximity to the SEZ. The nearest residences are in Gold Point, a well-preserved ghost town and point of interest for tourists about 2 mi (3.2 km) south of the SEZ. The town is located on BLM-administered lands; it thrived in the early 1900s, but most of the town was abandoned in the 1940s when mining operations ceased. The town currently has only a few occupied residences. The town of Tonopah is approximately 50 mi (80 km) to the north of the SEZ.

The nearest major road access to the proposed Gold Point SEZ is State Route 774, which parallels the eastern edge of the SEZ; U.S. 95 runs north–south as it passes within 9 mi (14 km) to the east of the SEZ. The UP Railroad serves the region; the closest stop is in Thorne, 160 mi (257 km) northwest of the SEZ. As of October 28, 2011, there were no pending solar applications within or adjacent to the SEZ.

As published in the Draft Solar PEIS (BLM and DOE 2010), the proposed Gold Point SEZ had a total area of 4,810 acres (19 km$^2$). In the Supplement to the Draft Solar PEIS (BLM and DOE 2011), no boundary revisions were identified for the proposed SEZ (see Figure 11.6.1.1-1). However, areas specified for non-development were mapped where data were available. For the proposed Gold Point SEZ, 214 acres (0.87 km$^2$) along a significant unnamed intermittent stream passing from west to east through the center of the SEZ was identified as a non-development area (see Figure 11.6.1.1-2). The remaining developable area within the SEZ is 4,596 acres (18.6 km$^2$).

The analyses in the following sections update the affected environment and potential environmental, cultural, and socioeconomic impacts associated with utility-scale solar energy development in the proposed Gold Point SEZ as described in the Draft Solar PEIS.

### 11.6.1.2 Development Assumptions for the Impact Analysis

Maximum solar development of the Gold Point SEZ was assumed to be 80% of the SEZ area over a period of 20 years, a maximum of 3,677 acres (15 km$^2$) (Table 11.6.1.2-1). Full development of the Gold Point SEZ would allow development of facilities with an estimated total of between 409 MW (power tower, dish engine, or PV technologies, 9 acres/MW [0.04 km$^2$/MW]) and 735 MW (solar trough technologies, 5 acres/MW [0.02 km$^2$/MW]) of electrical power capacity.

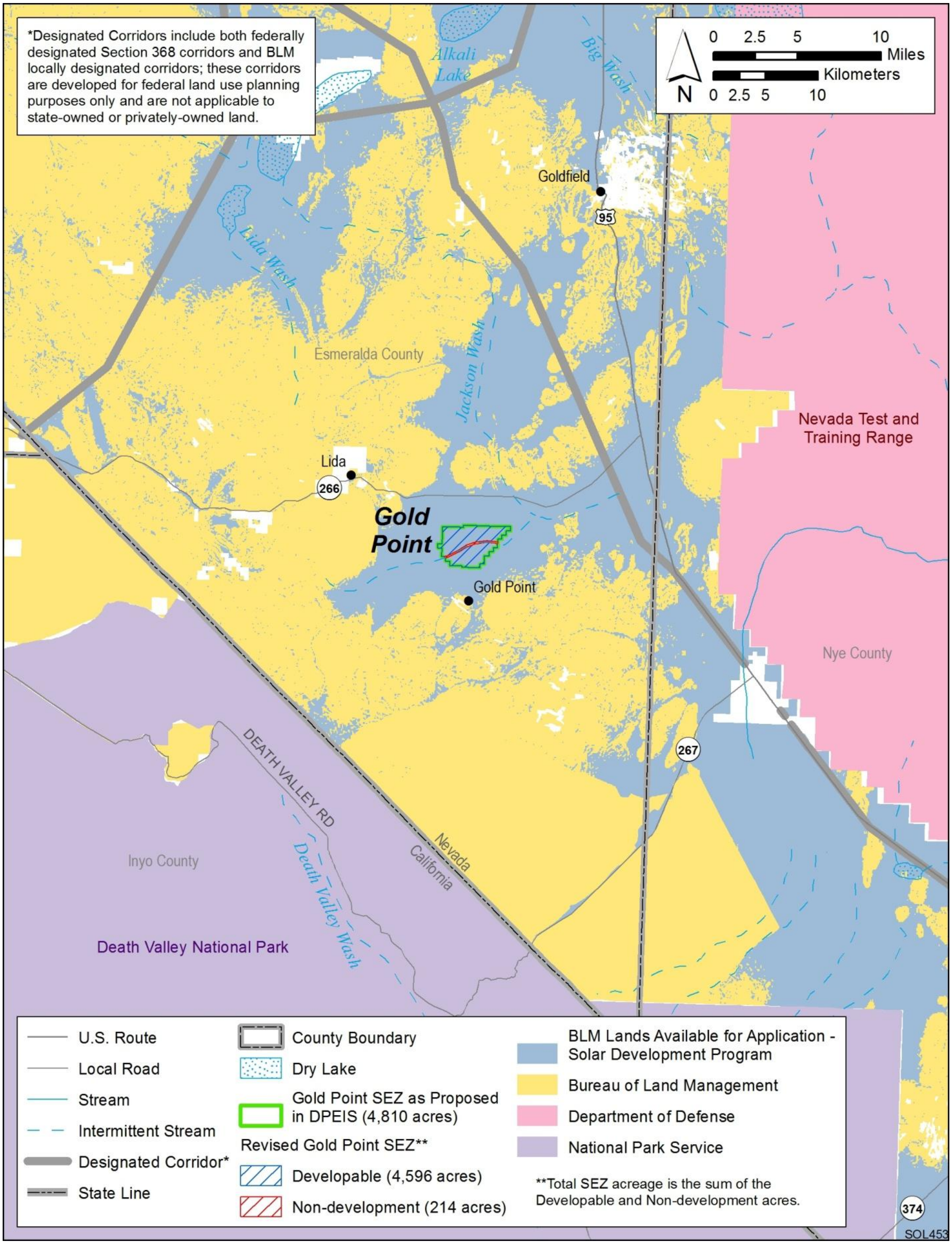


**FIGURE 11.6.1.1-1 Proposed Gold Point SEZ as Revised**

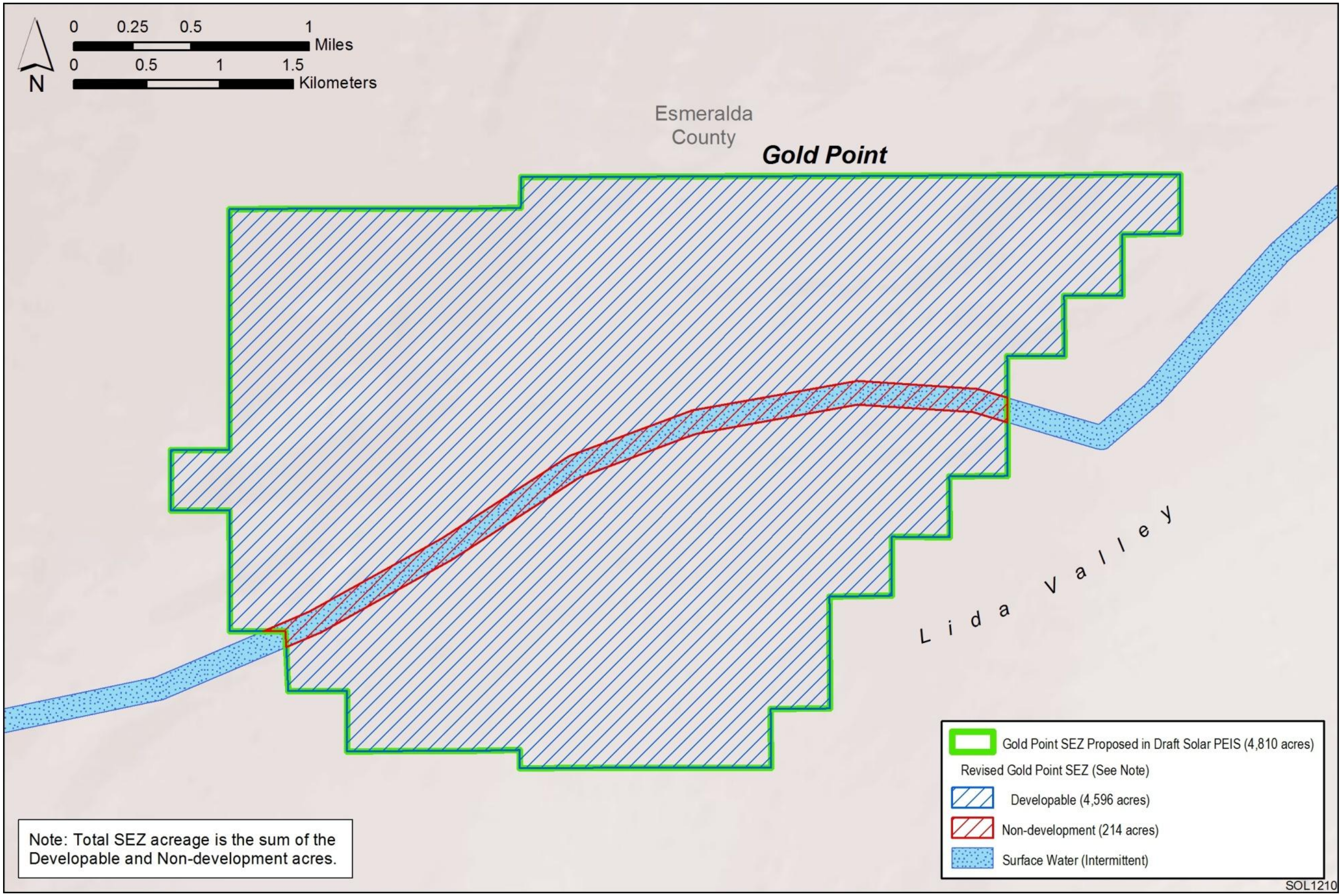


**FIGURE 11.6.1.1-2 Developable and Non-development Areas for the Proposed Gold Point SEZ as Revised**

**TABLE 11.6.1.2-1 Assumed Development Acreages, Solar MW Output, and Nearest Major Road and Transmission Line for the Proposed Gold Point SEZ as Revised**

| Total Developable Acreage and Assumed Developed Acreage (80% of Total) | Assumed Maximum SEZ Output for Various Solar Technologies | Distance to Nearest State, U.S., or Interstate Highway | Distance and Capacity of Nearest Existing Transmission Line[e] | Area of Assumed Road ROW | Distance to Nearest Designated Corridor[f] |
|---|---|---|---|---|---|
| 4,596 acres[a] and 3,677 acres | 409 MW[b] and 735 MW[c] | State Route 774 0 mi[d] | 3 mi and 345 kV | 0 acres | 6 mi |

[a] To convert acres to $km^2$, multiply by 0.004047.

[b] Maximum power output if the SEZ were fully developed using power tower, dish engine, or PV technologies, assuming 9 acres/MW (0.04 $km^2$/MW) of land required.

[c.] Maximum power output if the SEZ were fully developed using solar trough technologies, assuming 5 acres/MW (0.02 $km^2$/MW) of land required.

[d] To convert mi to km, multiply by 1.6093.

[e] In the Draft Solar PEIS, the nearest transmission line identified was a 120-kV line 22 mi (35 km) from the SEZ; this information has been updated.

[f] BLM-designated corridors are developed for federal land use planning purposes only and are not applicable to state-owned or privately owned land.

Availability of transmission from SEZs to load centers will be an important consideration for future development in SEZs. For the proposed Gold Point SEZ, updated data indicate that the nearest existing transmission line is a 345-kV north–south line located about 3 mi (5 km) east of the SEZ (the Draft Solar PEIS had indicated that the closest existing line was a 120-kV line 22 mi [35 km] to the west of the SEZ). It is possible that a new transmission line could be constructed from the SEZ to the existing line, but the capacity of the line could be inadequate for the possible 428 to 770 MW of new capacity. Therefore, at full build-out capacity, new transmission lines and/or upgrades of existing transmission lines would be required to bring electricity from the proposed Gold Point SEZ to load centers. An assessment of the most likely load center destinations for power generated at the Gold Point SEZ and a general assessment of the impacts of constructing and operating new transmission facilities to those load centers are provided in Section 11.6.23. In addition, the generic impacts of transmission lines and associated infrastructure construction and of line upgrades for various resources are discussed in Chapter 5 of this Final Solar PEIS. Project-specific analyses would also be required to identify the specific impacts of new transmission construction and line upgrades for any projects proposed within the SEZ.

The updated transmission assessment for the Gold Point SEZ no longer evaluates the specifically located hypothetical transmission corridor assessed in the Draft Solar PEIS because the actual location of such a tie-in line is unknown. For this Final Solar PEIS, the 667 acres (2.7 $km^2$) of land disturbance for a hypothetical transmission corridor to an existing transmission line is no longer assumed (although the impacts of required new transmission overall are addressed in Section 11.6.23).

For the proposed Gold Point SEZ, existing road access should be adequate to support construction and operation of solar facilities, because State Route 774 runs along the eastern border of the SEZ. Thus, no additional road construction outside of the SEZ is assumed to be required to support solar development, as summarized in Table 11.6.1.2-1.

### 11.6.1.3 Programmatic and SEZ-Specific Design Features

The proposed programmatic design features for each resource area to be required under the BLM Solar Energy Program are presented in Section A.2.2 of Appendix A of this Final Solar PEIS. These programmatic design features are intended to avoid, minimize, and/or mitigate adverse impacts from solar energy development and will be required for development on all BLM-administered lands, including SEZ and non-SEZ lands.

The discussions below addressing potential impacts of solar energy development on specific resource areas (Sections 11.6.2 through 11.6.22) also provide an assessment of the effectiveness of the programmatic design features in mitigating adverse impacts from solar development within the SEZ. SEZ-specific design features to address impacts specific to the proposed Gold Point SEZ may be required in addition to the programmatic design features. The proposed SEZ-specific design features for the Gold Point SEZ have been updated on the basis of revisions to the SEZ since the Draft Solar PEIS (such as boundary changes and the identification of non-development areas) and on the basis of comments received on the Draft and Supplement to the Draft Solar PEIS. All applicable SEZ-specific design features identified to date (including those from the Draft Solar PEIS that are still applicable) are presented in Sections 11.6.2 through 11.6.22.

## 11.6.2 Lands and Realty

### 11.6.2.1 Affected Environment

The exterior boundary of the proposed SEZ remains the same as that in the Draft Solar PEIS. Within the boundary of the proposed Gold Point SEZ, about 214 acres (0.87 $km^2$) along an intermittent stream has been identified as a non-development area. As stated in the Draft Solar PEIS, the area of the SEZ is isolated, and the land is undeveloped with only a few dirt roads present. A 345-kV transmission line 3 mi (5 km) east of the SEZ has now been identified as the closest existing transmission line to the SEZ.

### 11.6.2.2 Impacts

The description of impacts in the Draft Solar PEIS remains the same with the exception of the classification of land along the intermittent stream as a non-development area. The major impact of the proposed SEZ on lands and realty activities is still that it would establish an isolated industrial area in an otherwise rural and undeveloped setting area and would exclude other existing and potential uses of the land. Because the SEZ is undeveloped and isolated, utility-scale solar energy development would be a new and highly discordant land use to the area.

#### 11.6.2.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on lands and realty are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some mitigation for the identified impacts but will not mitigate all adverse impacts. For example, impacts related to the exclusion of many existing and potential uses of the public land; the visual impact of an industrial-type solar facility within an otherwise rural area; and induced land use changes, if any, on nearby or adjacent state and private lands may not be fully mitigated.

No SEZ-specific design features for lands and realty have been identified through this Final Solar PEIS. Some SEZ-specific design features may be established for parcels within the Gold Point SEZ through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.6.3 Specially Designated Areas and Lands with Wilderness Characteristics

#### 11.6.3.1 Affected Environment

As described in the Draft Solar PEIS, there are 6 specially designated areas within 25 mi of the proposed Gold Point SEZ that potentially could be affected by solar development in the SEZ: Death Valley NP, California Desert National Conservation Area, Death Valley WA, the Pigeon Spring and Queer Mountain WSAs, and the Fish Lake Valley SRMA.

#### 11.6.3.2 Impacts

The description in the Draft Solar PEIS remains valid with the exception noted in the following paragraph. It is anticipated there would be no to minimal impact on specially designated areas near the SEZ.

In the Summary Impacts Table, Table 11.6.1.3-1 of the Draft Solar PEIS, in the column titled Environmental Impacts and the row for Specially Designated Areas and Lands with Wilderness Characteristics, a potential adverse impact on night sky viewing was included. Further review of the night sky issue indicates that there is not likely to be an adverse impact. The rationale for this is the distance between the proposed Gold Point SEZ and the specially designated areas, and the anticipated effectiveness of the programmatic design feature included in Section A.2.2.1.13.1 of Appendix A of this Final Solar PEIS.

#### 11.6.3.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on specially designated areas are described in Section A.2.2 of Appendix A of this Final Solar PEIS (design features for both specially designated areas and visual resources would address impacts). Implementing the programmatic design features will provide some mitigation for the identified impacts.

No SEZ-specific design features for specially designated areas have been identified through this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.6.4 Rangeland Resources

### 11.6.4.1 Livestock Grazing

#### *11.6.4.1.1 Affected Environment*

One grazing allotment (the Magruder Mountain allotment) overlaps the proposed Gold Point SEZ, but only 0.7% of the allotment is within the SEZ.

#### *11.6.4.1.2 Impacts*

The conclusion in the Draft Solar PEIS that because less than 1% of the Magruder allotment overlaps the proposed SEZ there would be no impact on overall grazing use in the allotment is still applicable. Any cattle use displaced from the SEZ likely would be absorbed elsewhere in the allotment.

#### *11.6.4.1.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on livestock grazing are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some mitigation for any impacts.

No SEZ-specific design features to protect livestock grazing have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.6.4.2 Wild Horses and Burros

#### *11.6.4.2.1 Affected Environment*

As presented in Section 11.6.4.2.1 of the Draft Solar PEIS, no wild horse or burro HMAs occur within the proposed Gold Point SEZ or in close proximity to it.

#### *11.6.4.2.2 Impacts*

As presented in the Draft Solar PEIS, solar energy development within the proposed Gold Point SEZ would not directly affect wild horses and burros.

#### *11.6.4.2.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Because solar energy development within the proposed Gold Point SEZ would not affect wild horses and burros, no SEZ-specific design features to address wild horses and burros have been identified in this Final Solar PEIS.

## 11.6.5 Recreation

### 11.6.5.1 Affected Environment

The description of the area within and around the proposed Gold Point SEZ in the Draft Solar PEIS remains valid. The overall appearance of the site is uniform and somewhat monotonous, and it is believed that the area receives no significant recreational use.

### 11.6.5.2 Impacts

Although recreational use would be excluded from areas developed for solar energy production, the current level of use within the SEZ is so small that any loss of use would be insignificant.

In addition, lands that are outside of the proposed SEZ may be acquired or managed for mitigation of impacts on other resources (e.g., sensitive species). Managing these lands for mitigation could further exclude or restrict recreational use, potentially leading to additional losses in recreational opportunities in the region. The impact of acquisition and management of mitigation lands would be considered as a part of the environmental analysis of specific solar energy projects.

#### 11.6.5.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on recreational resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide adequate mitigation for the identified impacts.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features to address recreation impacts have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.6.6 Military and Civilian Aviation

#### 11.6.6.1 Affected Environment

The description in the Draft Solar PEIS remains valid. The proposed Gold Point SEZ is located under numerous MTRs and between two SUAs. The closest airport is the small BLM Lida Junction Airport, located about 10 mi (16 km) from the SEZ.

#### 11.6.6.2 Impacts

Impacts described in the Draft Solar PEIS remain valid and have been updated with additional input from the DoD. Impacts include the following:

- Solar development could encroach into MTR airspace that crosses the SEZ; structures higher than 50 ft (15 m) AGL may present unacceptable electromagnetic compatibility concerns for the NTTR test mission.

- Light from solar facilities could affect DoD nighttime operations.

Through comments on the Draft Solar PEIS and the Supplement to the Draft, the DoD expressed concern for solar energy facilities that might affect military test and training operations. The DoD requested that the technology at the proposed Gold Point SEZ be restricted to low-profile, low-glare PV technologies under 50-ft (15-m) AGL, similar to the PV I Array at Nellis Air Force Base.

#### 11.6.6.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on military and civilian aviation are described in Section A.2.2 of Appendix A of this Final Solar PEIS. The programmatic design features require early coordination with the DoD to identify and avoid, minimize, and/or mitigate, if possible, potential impacts on the use of military airspace.

No SEZ-specific design features to address impacts on military and civilian aviation have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.6.7 Geologic Setting and Soil Resources

### 11.6.7.1 Affected Environment

#### *11.6.7.1.1 Geologic Setting*

Data provided in the Draft Solar PEIS remain valid. The boundaries of the proposed SEZ remain the same, but about 214 acres (0.87 $km^2$) of a non-development area encompassing a significant unnamed intermittent stream has now been identified.

#### *11.6.7.1.2 Soil Resources*

Data provided in the Draft Solar PEIS remain valid, with the following update:

- Table 11.6.7.1-1 provides revised areas for soil map units taking into account non-development areas.

### 11.6.7.2 Impacts

Impacts on soil resources would occur mainly as a result of ground-disturbing activities (e.g., grading, excavating, and drilling), especially during the construction phase of a solar project. Because the developable area of the SEZ has changed by less than 5%, the assessment of impacts provided in the Draft Solar PEIS remains valid, with the following updates:

- Impacts related to wind erodibility are somewhat reduced because the identification of non-development areas eliminates 214 acres (0.87 $km^2$) of moderately erodible soils from development.

- Impacts related to water erodibility are somewhat reduced because the identification of non-development areas eliminates 12 acres (0.05 $km^2$) of moderately erodible soils from development.

**TABLE 11.6.7.1-1 Summary of Soil Map Units within the Proposed Gold Point SEZ as Revised**

| Map Unit Symbol[a] | Map Unit Name | Erosion Potential: Water[b] | Erosion Potential: Wind[c] | Description | Area in Acres[d] (percentage of SEZ) |
|---|---|---|---|---|---|
| 1000 | Keefa–Itme Association | Slight (0.20) | Moderate (WEG 3)[e] | Consists of about 70% Keefa sandy loam and 20% Itme gravelly loamy sand. Gently sloping soils on fan skirts, inset fans, and lake plains. Parent material consists of mixed alluvium (including from granitic rocks). Very deep and well drained, with moderate surface runoff potential and moderately rapid permeability. Available water capacity is low. Moderate rutting hazard. Used mainly as rangeland; unsuitable for cultivation. | 2,405 (50.0)[f] |
| 482 | Stonell–Wardenot–Izo association | Slight (0.05) | Moderate (WEG 5) | Consists of about 35% Stonell very gravelly sandy loam, 30% Wardenot very gravelly sandy loam, and 20% Izo very gravelly sand. Gently sloping soils on fan remnants, inset fans, and drainage ways. Parent material is mixed alluvium. Very deep and excessively drained, with low surface runoff potential (high infiltration rate) and moderately rapid permeability. Available water capacity is low to very low. Slight rutting hazard. Used mainly as rangeland and wildlife habitat; unsuitable for cultivation. | 1,077 (22.4) |
| 1033 | Papoose–Roic association | Moderate (0.37) | Moderate (WEG 3) | Consists of about 50% Papoose sandy loam and 45% Roic very gravelly loam. Gently to steeply sloping soils on lake terraces, hills, and pediments. Parent material is mixed alluvium and residuum and colluvium from tuffaceous sedimentary rocks. Very deep (Papoose soils) and very shallow (Roic soils over shallow paralithic bedrock) and well drained, with moderate surface runoff potential and moderate permeability. Available water capacity is low to very low. Moderate rutting hazard. Used mainly as rangeland or wildlife habitat; small areas may be irrigated and used for cropland (alfalfa and small grains). | 577 (12.0) |

**TABLE 11.6.7.1-1 (Cont.)**

| Map Unit Symbol[a] | Map Unit Name | Erosion Potential: Water[b] | Erosion Potential: Wind[c] | Description | Area in Acres[d] (percentage of SEZ) |
|---|---|---|---|---|---|
| 940 | Belted–Keefa association | Slight (0.10) | Moderate (WEG 3) | Consists of about 70% Belted gravelly loamy sand and 20% Keefa sandy loam. Gently to steeply sloping soils on beach terraces and fan skirts. Parent material consists of mixed alluvium. Very deep (Keefa soils) and very shallow (Belted soils over shallow duripan) and well drained, with high surface runoff potential (very slow infiltration rate) and moderate permeability. Available water capacity is low to very low. Moderate rutting hazard. Used mainly as rangeland, forest; unsuitable for cultivation. | 451 (9.4)[g] |
| 1031 | Papoose sandy loam (0 to 8% slopes) | Moderate (0.37) | Moderate (WEG 3) | Gently sloping soils on lake terraces. Parent material consists of mixed alluvium from tuffs, basalt, and andesite with small amounts of limestone and quartzite. Very deep and well drained, with moderate surface runoff potential and moderately slow permeability. Available water capacity is low. Moderate rutting hazard. Used mainly as rangeland or wildlife habitat; small areas may be irrigated and used for cropland (alfalfa and small grains). | 299 (6.2) |

[a] Map unit symbols are shown in Figure 11.6.7.1-5 of the Draft Solar PEIS.

[b] Water erosion potential rates based on soil erosion factor K (whole rock), which indicates the susceptibility of soil to sheet and rill erosion by water. Values range from 0.02 to 0.69 and are provided in parentheses under the general rating; a higher value indicates a higher susceptibility to erosion. Estimates based on the percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity. A rating of “slight” indicates that erosion is unlikely under ordinary climatic conditions.

[c] Wind erosion potential here is based on the wind erodibility group (WEG) designation: groups 1 and 2, high; groups 3 through 6, moderate; and groups 7 and 8, low (see footnote d for further explanation).

[d] To convert acres to $km^2$, multiply by 0.004047.

**Footnotes continued on next page.**

**TABLE 11.6.7.1-1 (Cont.)**

[e] WEGs are based on soil texture, content of organic matter, effervescence of carbonates, content of rock fragments, and mineralogy, and also take into account soil moisture, surface cover, soil surface roughness, wind velocity and direction, and the length of unsheltered distance (USDA 2004). Groups range in value from 1 (most susceptible to wind erosion) to 8 (least susceptible to wind erosion). The NRCS provides a wind erodibility index, expressed as an erosion rate in tons per acre per year, for each of the wind erodibility groups: WEG 1, 220 tons (200 metric tons) per acre (4,000 $m^2$) per year (average); WEG 2, 134 tons (122 metric tons) per acre (4,000 $m^2$) per year; WEGs 3 and 4 (and 4L), 86 tons (78 metric tons) per acre (0.004 $km^2$) per year; WEG 5, 56 tons (51 metric tons) per acre (0.004 $km^2$) per year; WEG 6, 48 tons (44 metric tons) per acre (4,000 $m^2$) per year; WEG 7, 38 tons (34 metric tons) per acre (4,000 $m^2$) per year; and WEG 8, 0 tons (0 metric tons) per acre (4,000 $m^2$) per year.

[f] A total of 202 acres (0.82 $km^2$) within the Keefa–Itme association is currently categorized as a “non-development” area.

[g] A total of 12 acres (0.049 $km^2$) within the Belted–Keefa association is currently categorized as a “non-development” area.

Source: NRCS (2010).

#### 11.6.7.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on soils are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will reduce the potential for soil impacts during all project phases.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features were identified for soil resources at the proposed Gold Point SEZ. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.6.8 Minerals (Fluids, Solids, and Geothermal Resources)

A mineral potential assessment for the proposed Gold Point SEZ has been prepared and reviewed by BLM mineral specialists knowledgeable about the region where the SEZ is located (BLM 2012). The BLM is proposing to withdraw the SEZ from settlement, sale, location, or entry under the general land laws, including the mining laws, for a period of 20 years (see Section 2.2.2.2.4 of the Final Solar PEIS). The potential impacts of this withdrawal are discussed in Section 11.6.24.

#### 11.6.8.1 Affected Environment

The description in the Draft Solar PEIS remains valid. There are no mining claims located in the proposed Gold Point SEZ (as of September 2010); however, the western half of the SEZ was previously blanketed by both lode and placer claims, which have been closed. There are no active oil and gas leases in the area and no active or historical geothermal development in or near the SEZ.

#### 11.6.8.2 Impacts

The description of the proposed SEZ in the Draft Solar PEIS is still accurate. If identified as an SEZ, it would continue to be closed to all incompatible forms of mineral development. Some future development of oil and gas resources beneath the SEZ would be possible, and production of common minerals could take place in areas not directly developed for solar energy production.

#### 11.6.8.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on mineral resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide adequate protection of mineral resources.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features for mineral resources have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.6.9 Water Resources

### 11.6.9.1 Affected Environment

The description of the affected environment given in the Draft Solar PEIS relevant to water resources at the proposed Gold Point SEZ remains valid and is summarized in the following paragraphs.

The Gold Point SEZ is within the Central Nevada Desert subbasin of the Great Basin hydrologic region. The SEZ is located in the southern portion of Lida Valley and surrounded by Slate Ridge to the south, Mount Jackson Ridge to the north, and Magruder Mountain and the Palmetto Mountains to the northwest. The average precipitation ranges from 3 to 6 in./yr (8 to 15 cm/yr), the average snowfall ranges from 6 to 18 in./yr (15 to 46 cm/yr), and the estimated pan evaporation rate is about 97 in./yr (246 cm/yr). No perennial surface water features or wetland areas are present in the SEZ. An unnamed intermittent/ephemeral stream and several washes, which are tributaries of Jackson Wash, drain toward the northeast across the SEZ. Flood hazards have not been identified for the SEZ, but for the adjacent Nye County an identified 100-year floodplain has been mapped for Jackson Wash that has a high probability of extending to areas within the SEZ. A total of 214 acres (0.9 $km^2$) along an intermittent/ephemeral tributary of Jackson Wash that cuts through the SEZ has been identified as a non-development area. The Gold Point SEZ is part of the Lida Valley groundwater basin, a basin-fill aquifer covering approximately 342,400 acres (1,386 $km^2$). The basin-fill aquifer consists of three units: consolidated rocks, older alluvium, and younger alluvium, which range in thickness from 500 to 2,460 ft (152 to 750 m). Estimates of groundwater recharge to the Lida Valley range from 50 to 700 ac-ft/yr (61,700 to 863,400 $m^3$/yr), depth to groundwater is on the order of 300 ft (91 m), and groundwater flows from southwest to northeast in the vicinity of the SEZ. Groundwater quality varies in the Lida Valley, but general impairments include TDS concentrations greater than 500 mg/L and sulfate concentrations greater than 250 mg/L.

All waters in Nevada are public property, and the NDWR is the agency responsible for managing both surface and groundwater resources. The Lida Valley groundwater basin is not a designated groundwater, thus there are no specific beneficial uses set by the NDWR. The estimate of perennial yield the NDWR uses to set water right limits is 350 ac-ft/yr (431,700 $m^3$/yr) for Lida Valley; current water rights total 76 ac-ft/yr (93,700 $m^3$/yr). Solar energy developers would have to submit applications for new groundwater withdrawals or transfer of existing water rights under the review of the NDWR.

In addition to the water resources information provided in the Draft Solar PEIS, this section provides a planning-level inventory of available climate, surface water, and groundwater monitoring stations within the immediate vicinity of the Gold Point SEZ and surrounding basin. Additional data regarding climate, surface water, and groundwater conditions are presented in Tables 11.6.9.1-1 through 11.6.9.1-7 and in Figures 11.6.9.1-1 and 11.6.9.1-2. Fieldwork and hydrologic analyses to determine 100-year floodplains and jurisdictional water bodies would need to be coordinated with appropriate federal, state, and local agencies. Areas within the Gold Point SEZ that are found to be within a 100-year floodplain will be identified as non-development areas. Any water features within the Gold Point SEZ determined to be jurisdictional will be subject to the permitting process described in the CWA.

**TABLE 11.6.9.1-1 Watershed and Water Management Basin Information Relevant to the Proposed Gold Point SEZ as Revised**

| Basin | Name | Area (acres)[b] |
|---|---|---|
| Subregion (HUC4)[a] | Central Nevada Desert Basins (1606) | 30,543,311 |
| Cataloging unit (HUC8) | Cactus-Sarcobatus Flats (16060013) | 1,764,557 |
| Groundwater basin | Lida Valley | 342,400 |
| SEZ | Gold Point | 4,810 |

[a] HUC = Hydrologic Unit Code; a USGS system for characterizing nested watersheds that includes large-scale subregions (HUC4) and small-scale cataloging units (HUC8).

[b] To convert acres to $km^2$, multiply by 0.004047.

**TABLE 11.6.9.1-2 Climate Station Information Relevant to the Proposed Gold Point SEZ as Revised**

| Climate Station (COOP ID[a]) | Elevation[b] (ft)[c] | Distance to SEZ (mi)[d] | Period of Record | Mean Annual Precipitation (in.)[e] | Mean Annual Snowfall (in.) |
|---|---|---|---|---|---|
| Dyer, Nevada (262431) | 4,900 | 42 | 1903–2011 | 4.98 | 12.60 |
| Goldfield, Nevada (263285) | 5,690 | 22 | 1906–2009 | 6.06 | 17.80 |
| Sarcobatus, Nevada (267319) | 4,022 | 21 | 1941–1961 | 3.36 | 5.50 |

[a] National Weather Service's Cooperative Station Network station identification code.

[b] Surface elevations for the proposed Gold Point SEZ range from 4,831 to 5,059 ft.

[c] To convert ft to m, multiply by 0.3048.

[d] To convert mi to km, multiply by 1.6093.

[e] To convert in. to cm, multiply by 2.540.

Source: NOAA (2012).

**TABLE 11.6.9.1-3 Total Lengths of Selected Streams at the Subregion, Cataloging Unit, and SEZ Scale Relevant to the Proposed Gold Point SEZ as Revised**

| Water Feature | Subregion, HUC4 (ft)[a] | Cataloging Unit, HUC8 (ft) | SEZ (ft) |
|---|---|---|---|
| Unclassified streams | 87,719 | 0 | 0 |
| Perennial streams | 10,923,723 | 0 | 0 |
| Intermittent/ephemeral streams | 724,309,083 | 46,805,586 | 110,704 |
| Canals | 4,035,992 | 80,411 | 0 |

[a] To convert ft to m, multiply by 0.3048.

Source: USGS (2012a).

**TABLE 11.6.9.1-4 Stream Discharge Information Relevant to the Proposed Gold Point SEZ as Revised**

| | Station (USGS ID) | |
|---|---|---|
| Parameter | Stonewall Flat Tributary near Goldfield, Nevada (10248970) | Lida Pass Tributary near Lida, Nevada (10248980) |
| Period of record | 1963–1984 | 1968–1981 |
| No. of observations | 20 | 14 |
| Discharge, median ($ft^3/s$) | 1 | 0 |
| Discharge, range ($ft^3/s$) | 0–150 | 0–1 |
| Discharge, most recent observation ($ft^3/s$) | 7.5 | 0 |
| Distance to SEZ (mi) | 16 | 11 |

[a] To convert $ft^3$ to $m^3$, multiply by 0.0283.

[b] To convert mi to km, multiply by 1.6093.

Source: USGS (2012b).

## 11.6.9.2 Impacts

### *11.6.9.2.1 Land Disturbance Impacts on Water Resources*

The discussion of land disturbance effects on water resources in the Draft Solar PEIS remains valid. As stated in the Draft Solar PEIS, land disturbance impacts in the vicinity of the proposed Gold Point SEZ could potentially affect drainage patterns, intermittent/ephemeral

**TABLE 11.6.9.1-5 Surface Water Quality Data Relevant to the Proposed Gold Point SEZ as Revised**

| Station (USGS ID) | Period of Record | No. of Records |
|---|---|---|
| No water quality data are available for surface water stations in the SEZ's HUC8 watershed. | NA[a] | |

[a] NA = no data collected for this parameter.

Source: USGS (2012b).

**TABLE 11.6.9.1-6 Water Quality Data from Groundwater Samples Relevant to the Proposed Gold Point SEZ as Revised**

| | Station (USGS ID)[a] |
|---|---|
| Parameter | 371647117015201 |
| Period of record | 2003 |
| No. of records | 1 |
| Temperature (°C)[b] | 21.5 |
| Total dissolved solids (mg/L) | 978 |
| Dissolved oxygen (mg/L) | 4.4 |
| pH | 7.2 |
| Nitrate + nitrite (mg/L as N) | 0.97 |
| Phosphate (mg/L) | 0.028 |
| Organic carbon (mg/L) | NA[c] |
| Calcium (mg/L) | NA |
| Magnesium (mg/L) | NA |
| Sodium (mg/L) | NA |
| Chloride (mg/L) | NA |
| Sulfate (mg/L) | NA |
| Arsenic (μ/L) | NA |

[a] Median values are listed.

[b] To convert °C to °F, multiply by 1.8, then add 32.

[c] NA = no data collected for this parameter.

Source: USGS (2012b).

**TABLE 11.6.9.1-7 Groundwater Surface Elevations Relevant to the Proposed Gold Point SEZ as Revised**

| | Station (USGS ID) | | |
|---|---|---|---|
| Parameter | 372138117274001 | 373003117110101 | 372700117110001 |
| Period of record | 1967–1984 | 1958 | 1967–1994 |
| No. of observations | 2 | 1 | 16 |
| Surface elevation (ft)[a] | 5,262 | 4,690 | 4,622 |
| Well depth (ft) | NA | 604 | NA |
| Depth to water, median (ft) | 306.06 | 365 | 288.3 |
| Depth to water range, (ft) | 302.12–310 | – | 283.74–297.96 |
| Depth to water, most recent observation (ft) | 302.12 | 365 | 287.44 |
| Distance to SEZ (mi)[b] | 6 | 12 | 11 |

[a] To convert ft to m, multiply by 0.3048.

[b] To convert mi to km, multiply by 1.6093.

Source: USGS (2012b).

streamflows, and groundwater recharge and discharge properties. The alteration of naturaldrainage pathways during construction can lead to impacts related to flooding, loss of water delivery to downstream regions, and alterations to riparian vegetation and habitats. The identification of non-development areas associated with the intermittent tributary to Jackson Wash was made using low-resolution data from the National Hydrography Dataset (USGS 2012a), which did not completely capture the braided channels of the unnamed intermittent tributary to Jackson Wash as shown in Figure 11.6.9.1-1 of this Final Solar PEIS.

Land clearing, land leveling, and vegetation removal during the development of the SEZ have the potential to disrupt intermittent/ephemeral stream channels. Several programmatic design features described in Section A.2.2 of Appendix A of this Final Solar PEIS would avoid, minimize, and/or mitigate impacts associated with the disruption of intermittent/ephemeral water features. Additional analyses of intermittent/ephemeral streams are presented in this update, including an evaluation of functional aspects of stream channels with respect to groundwater recharge, flood conveyance, sediment transport, geomorphology, and ecological habitats. Only a summary of the results from these surface water analyses is presented in this section; more information on methods and results is presented in Appendix O.

The study region considered for the intermittent/ephemeral stream evaluation relevant to the Gold Point SEZ is a subset of the Cactus-Sarcobatus Flats watershed (HUC8), for which information regarding stream channels is presented in Tables 11.6.9.1-3 and 11.6.9.1-4 of this Final Solar PEIS. The results of the intermittent/ephemeral stream evaluation are shown in Figure 11.6.9.2-1, which depicts flow lines from the National Hydrography Dataset (USGS 2012a) labeled as low, moderate, and high sensitivity to land disturbance. Within the study area, 22% of the intermittent/ephemeral stream channels had low sensitivity, 64% had

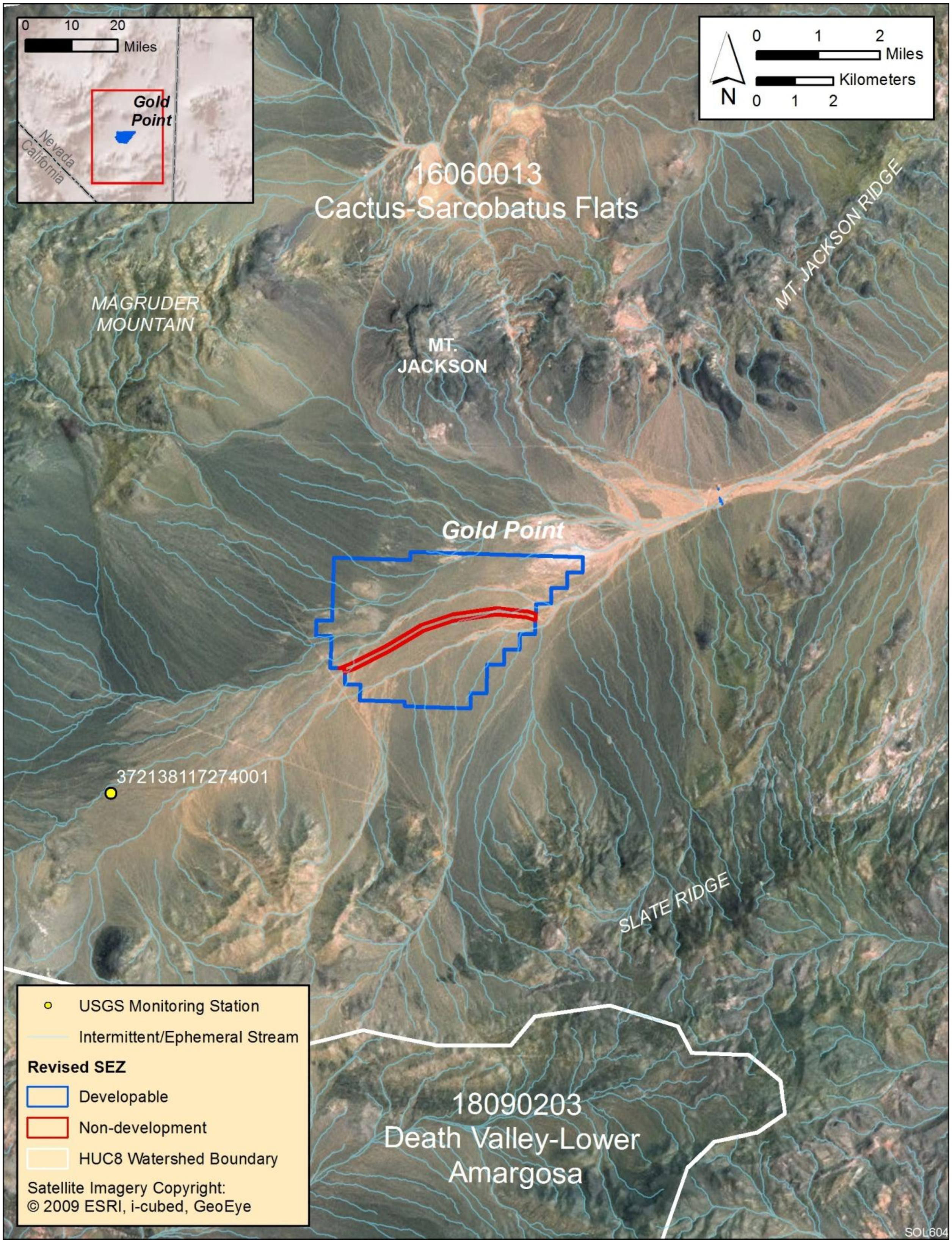


**FIGURE 11.6.9.1-1 Water Features near the Proposed Gold Point SEZ as Revised**

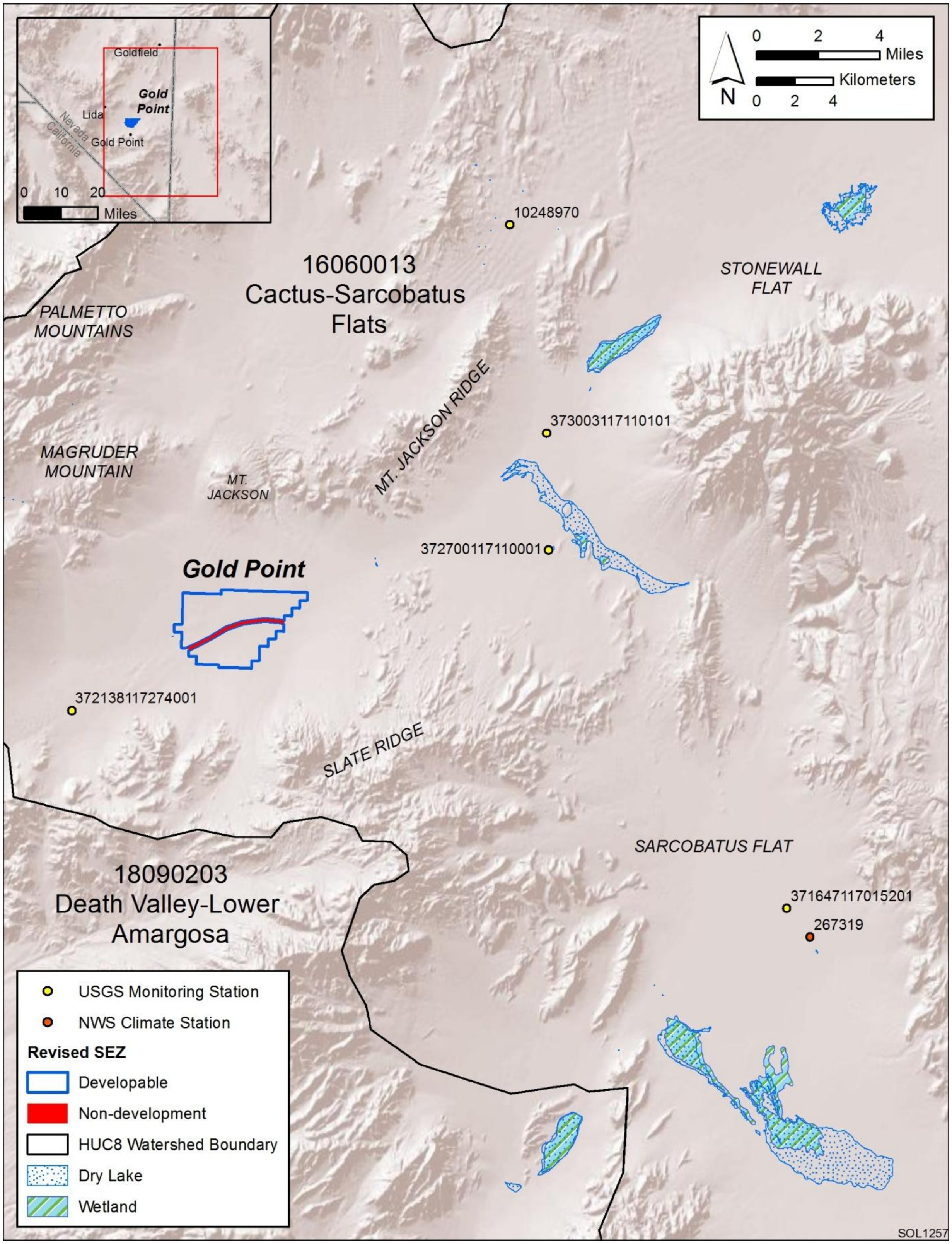


**FIGURE 11.6.9.1-2 Water Features within the Catus-Sarcobatus Flats Watershed, Which Includes the Proposed Gold Point SEZ as Revised**

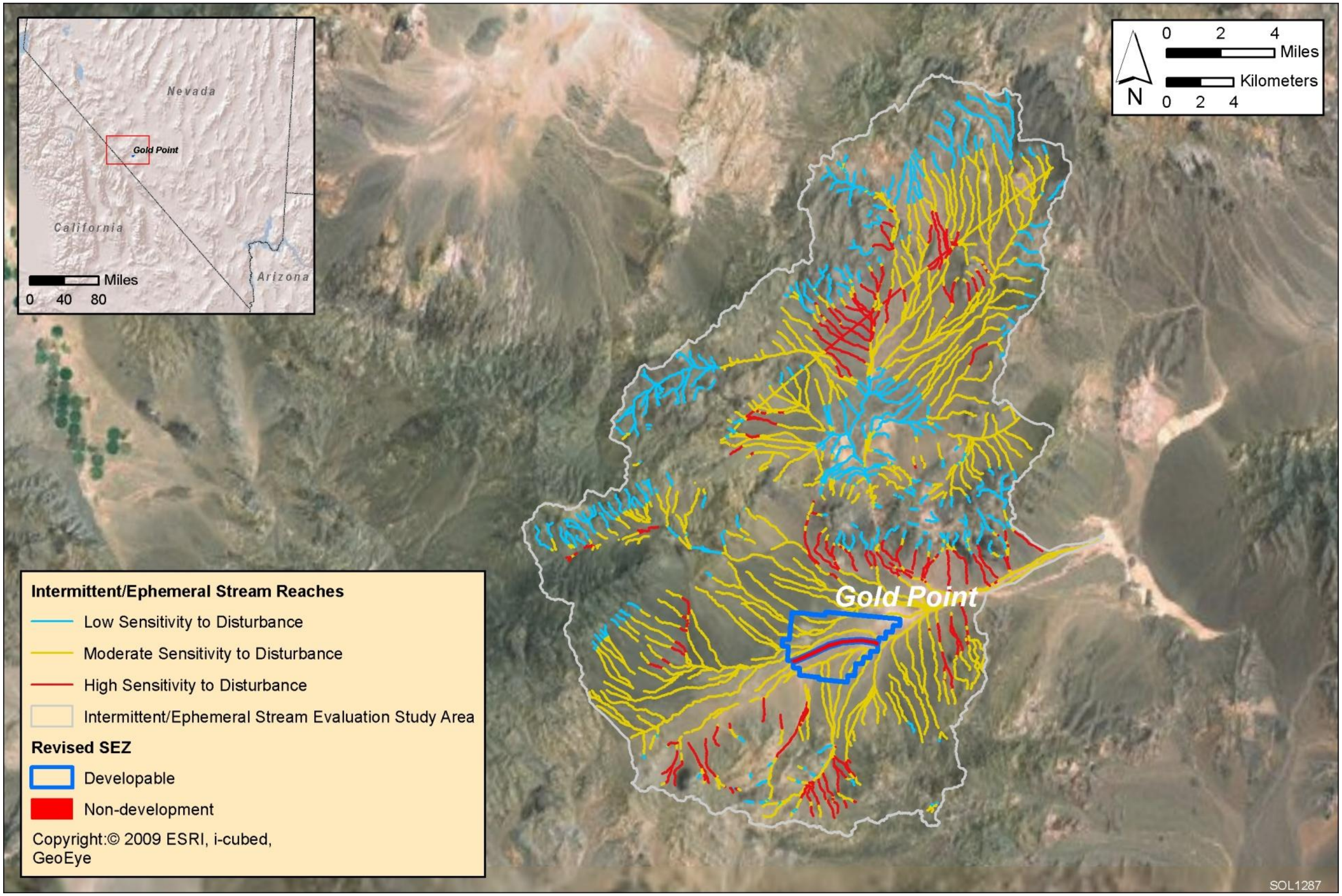


**FIGURE 11.6.9.2-1 Intermittent/Ephemeral Stream Channel Sensitivity to Surface Disturbances in the Vicinity of the Proposed Gold Point SEZ as Revised**

moderate sensitivity, and 13% had high sensitivity to land disturbance. All stream reaches within the SEZ have moderate sensitivity to land disturbance.

#### *11.6.9.2.2 Water Use Requirements for Solar Energy Technologies*

The water use requirements for full build-out scenarios of the Gold Point SEZ have not changed from the values presented in the Draft Solar PEIS (see Tables 11.7.9.2-1 and 11.7.9.2-2 in the Draft Solar PEIS). This section presents additional analyses pertaining to groundwater, which includes a basin-scale groundwater budget and a simplified, one-dimensional groundwater model of potential groundwater drawdown. Only a summary of the results from these groundwater analyses is presented in this section; more information on methods and results is presented in Appendix O.

The estimated total water use requirements during the peak construction year are as high as 1,707 ac-ft/yr (2.1 million $m^3$/yr). The total annual water requirements for operations were categorized as low, medium, and high groundwater pumping scenarios that represent full build-out of the SEZ, assuming PV, dry-cooled parabolic trough, and wet-cooled parabolic trough, respectively (a 30% operational time was considered for all solar facility types on the basis of operations estimates for proposed utility-scale solar energy facilities). This categorization results in water use estimates that range from 22 to 3,859 ac-ft/yr (27,100 to 4.8 million $m^3$/yr), or a total of 440 to 77,180 ac-ft (542,700 to 95.2 million $m^3$) over the 20-year operational period.

A basin-scale groundwater budget was assembled using available data on groundwater inputs, outputs, and storage (Table 11.6.9.2-1) for comparison with water use estimates relating to solar energy development. The peak construction year water requirements are greater than the total annual groundwater inputs to the Lida Valley Basin, but only represent 0.3% of the groundwater storage. Given the short duration of construction activities, impacts associated with the construction water demand are considered minimal. The long duration of groundwater pumping during operations (20 years) poses a greater threat to groundwater resources. The high pumping scenario exceeds the annual groundwater inputs to the basin by more than a factor of 5, and 13% of the groundwater storage over the 20-year operational period. The medium pumping scenario is similar to the amount of groundwater recharge the basin receives from precipitation and 2% of the groundwater storage over the 20-year operational period. The low pumping scenario poses the least impacts considering its relative magnitude to groundwater inputs to the basin, and it represents only 6% of the perennial yield set by the NDWR to guide allocations of water rights.

Groundwater budgeting allows for quantification of complex groundwater processes at the basin scale, but it ignores the temporal and spatial components of how groundwater withdrawals affect groundwater surface elevations, groundwater flow rates, and connectivity to surface water features such as streams, wetlands, playas, and riparian vegetation. A one-dimensional groundwater modeling analysis was performed to present a simplified depiction of the spatial and temporal effects of groundwater withdrawals by examining groundwater drawdown in a radial direction around the center of the SEZ for the low, medium, and high

**TABLE 11.6.9.2-1 Groundwater Budget for the Lida Valley Groundwater Basin, Which Includes the Proposed Gold Point SEZ as Revised**

| Process | Amount[a] |
|---|---|
| *Inputs* | |
| Precipitation recharge (ac-ft/yr) | 500 |
| Underflow from Stonewall Flat (ac-ft/yr) | 200 |
| *Outputs* | |
| Underflow to Sarcobatus Flat (ac-ft/yr) | 700 |
| Discharge to springs (ac-ft/yr) | 20 |
| Groundwater withdrawals, 1966 (ac-ft/yr) | 30 |
| *Storage* | |
| Storage (ac-ft) | 600,000 |
| Perennial yield (ac-ft/yr) | 350[b] |

[a] To convert ac-ft to $m^3$, multiply by 1,234.

[b] Defined by NDWR

Source: Rush (1968).

pumping scenarios. A detailed discussion of the groundwater modeling analysis is presented in Appendix O. It should be noted, however, that the aquifer parameters used for the one-dimensional groundwater model (Table 11.6.9.2-2) represent available literature data, and that the model aggregates these value ranges into a simplistic representation of the aquifer.

Depth to groundwater ranges between 300 and 400 ft (91 and 122 m) below the surface in the Lida Valley. The one-dimensional groundwater modeling results suggest that groundwater withdrawals for solar energy development would result in groundwater drawdown in the vicinity of the SEZ (approximately a 2-mi [3.2-km] radius) that ranges up to 20 ft (6 m) for the high pumping scenario, up to 3 ft (1 m) for the medium pumping scenario, and less than 1 ft (0.3 m) for the low pumping scenario (Figure 11.6.9.2-2). The majority of the groundwater drawdown occurs within the vicinity of the SEZ. However, more than 2 ft (0.6 m) of drawdown occurs 10 mi (16 km) away from the SEZ under the high pumping scenario, and 1 ft (0.3 m) of drawdown occurs 5 mi (8 km) away from the SEZ under the medium pumping scenario.

#### *11.6.9.2.3 Off-Site Impacts: Roads and Transmission Lines*

As stated in the Draft Solar PEIS, impacts associated with the construction of roads and transmission lines primarily deal with water use demands for construction, water quality concerns relating to potential chemical spills, and land disturbance effects on the natural hydrology. Water needed for transmission line construction activities (e.g., for soil compaction, dust suppression, and potable supply for workers) could be trucked to the construction area from

**TABLE 11.6.9.2-2 Aquifer Characteristics and Assumptions Used in the One-Dimensional Groundwater Model for the Proposed Gold Point SEZ as Revised**

| Parameter | Value[a] |
|---|---|
| Aquifer type/conditions | Basin fill/unconfined |
| Aquifer thickness (ft)[b] | 500–2,460 (1,000) |
| Hydraulic conductivity (ft/day)[c] | 0.003–427 (36) |
| Transmissivity ($ft^2$/day) | 36,089 |
| Specific yield[c] | 0.0004–0.2 (0.03) |
| Analysis period (yr) | 20 |
| High pumping scenario (ac-ft/yr)[d] | 3,859 |
| Medium pumping scenario (ac-ft/yr)[d] | 550 |
| Low pumping scenario (ac-ft/yr)[d] | 22 |

a Values in parentheses used for modeling analysis.

b Faunt et al. (2004).

c Belcher et al. (2001).

d To convert ac-ft to $m^3$, multiply by 1,234.

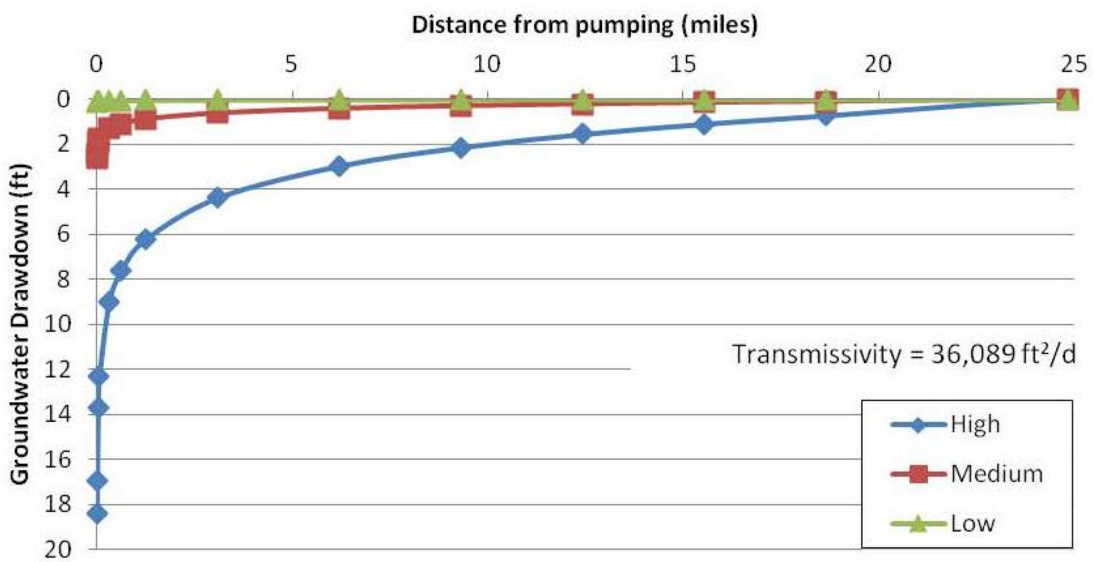


**FIGURE 11.6.9.2-2 Estimated One-Dimensional Groundwater Drawdown Resulting from High, Medium, and Low Groundwater Pumping Scenarios over the 20-Year Operational Period at the Proposed Gold Point SEZ as Revised**

an off-site source. If this occurred, water use impacts at the SEZ would be negligible. The Draft Solar PEIS assessment of impacts on water resources from road and transmission line construction remains valid.

#### *11.6.9.2.4 Summary of Impacts on Water Resources*

The additional information and analyses of water resources presented in this update agree with information provided in the Draft Solar PEIS, which indicates that the Gold Point SEZ is located in a high-elevation desert valley where water resources are primarily groundwater, along with intermittent/ephemeral surface water features. Groundwater is primarily found in the basin-fill aquifer that is connected to adjacent valleys. Current groundwater withdrawals in the Lida Valley Basin are unknown, but water right allocations total 245 ac-ft/yr (302,200 $m^3$/yr) primarily for commercial uses (NDWR 2012).

Disturbances to intermittent/ephemeral streams within the Gold Point SEZ could potentially affect ecological habitats associated with the stream channels within the SEZ. The intermittent/ephemeral stream evaluation identified several stream reaches in the study region with moderate sensitivity to land disturbance; however, high-sensitivity reaches with respect to groundwater recharge, flood and sediment conveyance, and ecological habitats were variable across the study area, but typically the total sensitivity was in the moderate range (Figure O.1-5 in Appendix O). In addition, portions of the tributary channels to Jackson Wash extend outside the non-development area of the SEZ. As stated in the Draft Solar PEIS, floodplain maps in the adjacent Nye County suggest that 100-year floodplain areas could be associated with these tributary channels, and design features in Appendix A of this Final Solar PEIS describe the need to avoid identified 100-year floodplain areas.

Groundwater withdrawals associated with the medium and high pumping scenarios have the potential to adversely affect groundwater resources in the Lida Valley as they are equal to or greatly exceed groundwater recharge for the basin. Groundwater withdrawals associated with the low pumping scenario are preferred given the groundwater budget constraints, along with the minimal observed groundwater drawdown estimated by the one-dimensional modeling analysis. Ultimately, securing water rights may limit groundwater withdrawals as the perennial yield of the Lida Valley is set at 350 ac-ft/yr (431,700 $m^3$/yr), which the NDWR uses as a guideline in allocating water rights.

Predicting impacts associated with groundwater withdrawals is often difficult given the heterogeneity of aquifer characteristics, the long time period between the onset of pumping and its effects, and limited data. One of the primary mitigation measures to protect water resources is the implementation of long-term monitoring and adaptive management (see Section A.2.4 of Appendix A). For groundwater, this requires the combination of monitoring and modeling to fully identify the temporal and spatial extent of potential impacts. The framework for a long-term monitoring program would need to be created for the Gold Point SEZ once development begins.

#### 11.6.9.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on surface water and groundwater are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some protection of and reduce impacts on water resources.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, the following SEZ-specific design feature has been identified:

- Groundwater analyses suggest that full build-out of wet- and dry-cooled technologies is not feasible; for mixed-technology development scenarios, any proposed wet- and dry-cooled projects should utilize water conservation practices.

The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.6.10 Vegetation

#### 11.6.10.1 Affected Environment

The proposed Gold Point SEZ was revised to identify 214 acres (0.87 km$^2$) along a significant unnamed intermittent stream traversing the SEZ from west to east as a non-development area. In addition, the assumed transmission line was removed from consideration.

As presented in Section 11.6.10.1 of the Draft Solar PEIS, 5 cover types were identified within the area of the proposed Gold Point SEZ, while 16 cover types were identified in the area of indirect impacts, including the assumed transmission line corridor. Sensitive habitats on the SEZ include riparian, desert dry wash, and playa habitats. Because of the removal of the assumed transmission line from consideration, the Developed (Open Space-Low Intensity) and Developed (Medium-High Intensity) cover types are no longer within the indirect impact area. Figure 11.6.10.1-1 shows the cover types within the affected area of the Gold Point SEZ as revised.

#### 11.6.10.2 Impacts

As presented in the Draft Solar PEIS, the construction of solar energy facilities within the proposed Gold Point SEZ would result in direct impacts on plant communities because of the removal of vegetation within the facility footprint during land-clearing and land-grading operations. Approximately 80% of the SEZ would be expected to be cleared with full

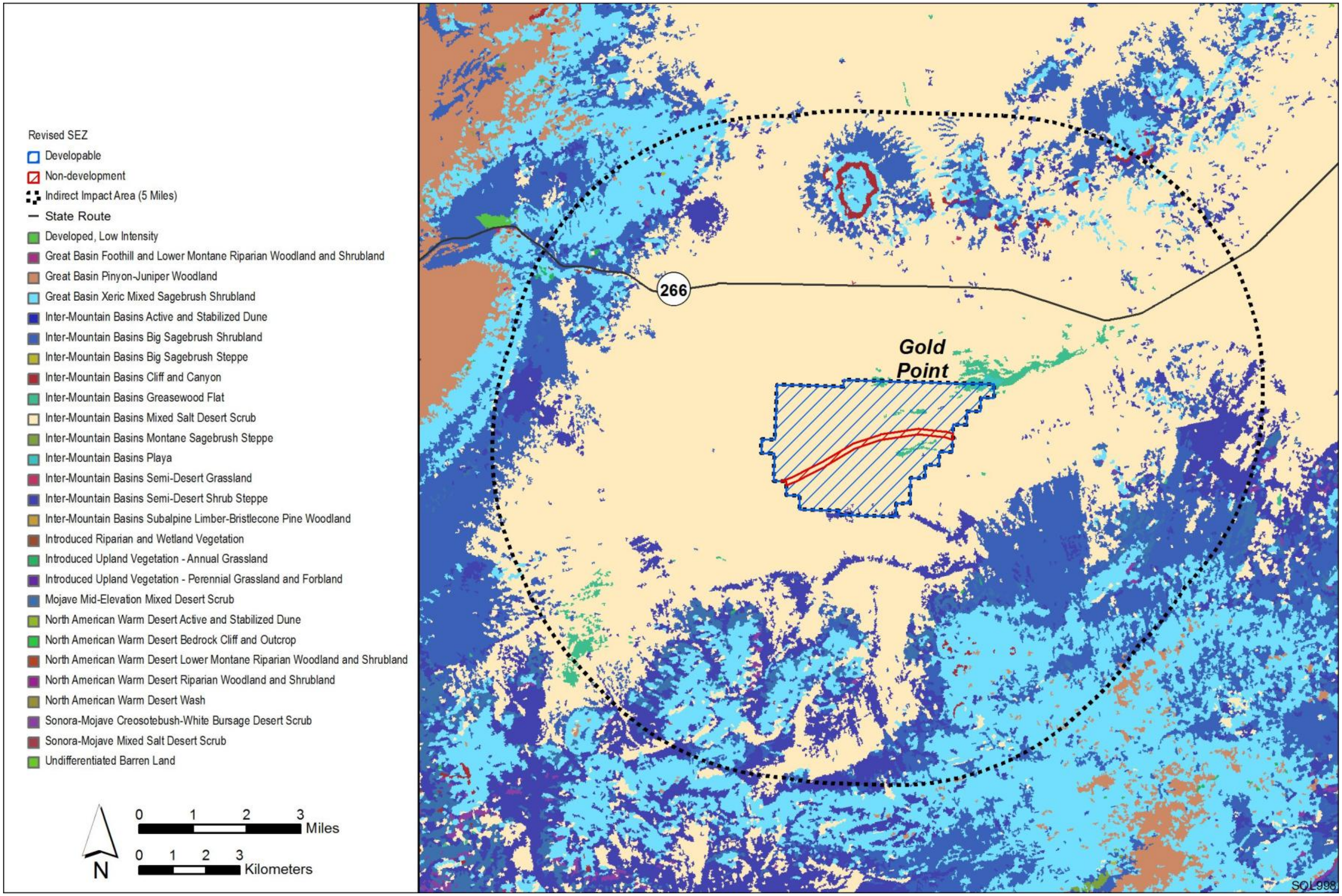


**FIGURE 11.6.10.1-1 Land Cover Types within the Proposed Gold Point SEZ as Revised**

development of the SEZ. As a result of the changes to the proposed SEZ developable area, approximately 3,677 acres (14.9 $km^2$) would be cleared.

Overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the cover type within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of a cover type would be lost; and (3) *large*: >10% of a cover type would be lost.

##### *11.6.10.2.1 Impacts on Native Species*

The analysis presented in the Draft Solar PEIS based on the original Gold Point SEZ developable area indicated that development would result in a small impact on all land cover types occurring within the SEZ (Table 11.6.10.1-1 in the Draft Solar PEIS). Development within the revised Gold Point SEZ could still directly affect all of the cover types evaluated in the Draft Solar PEIS. The reduction in the developable area would result in reduced impact levels on these cover types in the affected area, but the impact magnitudes would remain unchanged compared to the original estimates in the Draft Solar PEIS.

Direct impacts on the stream that occurs within the non-developable portion of the SEZ, or the previously identified transmission corridor, would not occur. As a result, direct impacts on the Developed (Open Space-Low Intensity) and Developed (Medium-High Intensity) cover types, which had occurred within the transmission corridor, would not occur. However, direct impacts on dry washes and playas could still occur. Indirect impacts on habitats associated with playas, washes, or riparian habitats within or near the SEZ, as described in the Draft Solar PEIS, could also occur.

##### *11.6.10.2.2 Impacts from Noxious Weeds and Invasive Plant Species*

As presented in the Draft Solar PEIS, land disturbance from project activities and indirect effects of construction and operation within the Gold Point SEZ could potentially result in the establishment or expansion of noxious weeds and invasive species populations, potentially including those species listed in Section 11.6.10.1 of the Draft Solar PEIS. Impacts such as reduced restoration success and possible widespread habitat degradation could still occur; however, a small reduction in the potential for such impacts would result from the reduced developable area of the SEZ.

#### 11.6.10.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on vegetation are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific species and habitats determine how programmatic design features are applied, for example:

- All riparian, dry wash, and playa communities within the SEZ shall be avoided to the extent practicable, and any impacts minimized and mitigated in consultation with appropriate agencies. Any Joshua tree or other *Yucca* species, cacti, or succulent plant species that cannot be avoided shall be salvaged. A buffer area shall be maintained around dry wash, riparian, and playa habitats to reduce the potential for impacts.

- Appropriate engineering controls shall be used to minimize impacts on dry wash, playa, wetland, greasewood flat, and riparian habitats, including downstream occurrences, resulting from surface water runoff, erosion, sedimentation, altered hydrology, accidental spills, or fugitive dust deposition. Appropriate buffers and engineering controls will be determined through agency consultation.

- Groundwater withdrawals shall be limited to reduce the potential for indirect impacts on habitats associated with springs. Potential impacts on springs shall be determined through hydrological studies.

It is anticipated that implementation of these programmatic design features will reduce a high potential for impacts from invasive species and impacts on dry washes, playas, riparian habitats, wetlands, and springs to a minimal potential for impact. Residual impacts on groundwater-dependent habitats could result from limited groundwater withdrawal; however, it is anticipated that these impacts would be avoided in the majority of instances.

On the basis of impact analyses conducted for the Draft Solar PEIS, updates to those analyses due to changes to the SEZ boundaries, and consideration of comments received as applicable, no SEZ-specific design features for vegetation have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.6.11 Wildlife and Aquatic Biota

For the assessment of potential impacts on wildlife and aquatic biota, overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the species' habitat within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of the species' habitat would be lost; and (3) *large*: >10% of the species' habitat would be lost.

### 11.6.11.1 Amphibians and Reptiles

#### *11.6.11.1.1 Affected Environment*

As presented in Section 11.6.11.1 of the Draft Solar PEIS, representative amphibian and reptile species expected to occur within the Gold Point SEZ include the Great Plains toad (*Bufo* *cognatus*), red-spotted toad (*Bufo punctatus*), desert horned lizard (*Phrynosoma platyrhinos*), Great Basin collared lizard (*Crotaphytus bicinctores*), long-nosed leopard lizard (*Gambelia wislizenii*), western fence lizard (*Sceloporus occidentalis*), western whiptail (*Cnemidophorus tigris*), zebra-tailed lizard (*Callisaurus draconoides*), coachwhip (*Masticophis flagellum*), common kingsnake (*Lampropeltis getula*), glossy snake (*Arizona elegans*), gophersnake (*Pituophis catenifer*), groundsnake (*Sonora semiannulata*), long-nosed snake (*Rhinocheilus lecontei*), nightsnake (*Hypsiglena torquata*), and Mojave rattlesnake (*Crotalus scutulatus*).

##### *11.6.11.1.2 Impacts*

As presented in the Draft Solar PEIS, solar energy development within the proposed Gold Point SEZ could affect potentially suitable habitats for the representative amphibian and reptile species. The analysis presented in the Draft Solar PEIS for the Gold Point SEZ indicated that development would result in a small overall impact on all representative amphibian and reptile species (Table 11.6.11.1-1 in the Draft Solar PEIS). The reduction in the developable area of the Gold Point SEZ would result in reduced habitat impacts for all representative amphibian and reptile species; the resultant impact levels for all the representative species would still be small.

##### *11.6.11.1.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on amphibian and reptile species are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific conditions will be considered when programmatic design features are applied, for example:

- Development in wash, playa, and cliff and canyon habitats shall be avoided.

The major wash (significant unnamed intermittent stream) in the SEZ has been identified as a non-development area, but other avoidable washes may exist within the SEZ. With the implementation of programmatic design features, impacts on amphibian and reptile species would be reduced.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features for amphibian and reptile species have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

#### 11.6.11.2 Birds

##### *11.6.11.2.1 Affected Environment*

As presented in Section 11.6.11.2.1 of the Draft Solar PEIS, a large number of bird species could occur or have potentially suitable habitat within the affected area of the proposed

Gold Point SEZ. Representative bird species identified in the Draft Solar PEIS include (1) shorebirds: killdeer (*Charadrius vociferus*); (2) passerines: ash-throated flycatcher (*Myiarchus cinerascens*), Bewick's wren (*Thryomanes bewickii*), black-tailed gnatcatcher (*Polioptila melanura*), black-throated sparrow (*Amphispiza bilineata*), Brewer's sparrow (*Spizella breweri*), cactus wren (*Campylorhynchus brunneicapillus*), common poorwill (*Phalaenoptilus nuttallii*), common raven (*Corvus corax*), greater roadrunner (*Geococcyx californianus*), horned lark (*Eremophila alpestris*), ladder-backed woodpecker (*Picoides scalaris*), Le Conte's thrasher (*Toxostoma lecontei*), lesser nighthawk (*Chordeiles acutipennis*), loggerhead shrike (*Lanius ludovicianus*), northern mockingbird (*Mimus polyglottos*), rock wren (*Salpinctes obsoletus*), sage sparrow (*Amphispiza belli*), Say's phoebe (*Sayornis saya*), and western kingbird (*Tyrannus verticalis*); (3) raptors: American kestrel (*Falco sparverius*), golden eagle (*Aquila chrysaetos*), great horned owl (*Bubo virginianus*), long-eared owl (*Asio otus*), red-tailed hawk (*Buteo jamaicensis*), and turkey vulture (*Cathartes aura*); and (4) upland gamebirds: chukar (*Alectoris chukar*), Gambel's quail (*Callipepla gambelii*), and mourning dove (*Zenaida macroura*).

#### *11.6.11.2.2 Impacts*

As presented in the Draft Solar PEIS, solar energy development within the Gold Point SEZ could affect potentially suitable bird habitats. The analysis presented in the Draft Solar PEIS indicated that development would result in a small overall impact on all representative bird species (Table 11.6.11.2-1 in the Draft Solar PEIS). The reduction in the developable area of the Gold Point SEZ would result in reduced habitat impacts for all representative bird species; the resultant impact levels for all representative bird species would still be small.

#### *11.6.11.2.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on bird species are described in Section A.2.2 of Appendix A of this Final Solar PEIS. With the implementation of required programmatic design features, impacts on bird species are anticipated to be small.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, the following SEZ-specific design feature for birds has been identified:

- Wash and playa habitats should be avoided. The major wash (significant unnamed intermittent stream) in the SEZ has been identified as a non-development area, but other avoidable washes may exist within the SEZ.

If SEZ-specific design features are implemented in addition to required programmatic design features, impacts on bird species would be small. The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.6.11.3 Mammals

#### *11.6.11.3.1 Affected Environment*

As presented in Section 11.6.11.3.1 of the Draft Solar PEIS, a large number of mammal species were identified that could occur or have potentially suitable habitat within the affected area of the proposed Gold Point SEZ. Representative mammal species identified in the Draft Solar PEIS include (1) big game species: cougar (*Puma concolor*), elk (*Cervus canadensis*), mule deer (*Odocoileus hemionus*), and pronghorn (*Antilocapra americana*), (2) furbearers and small game species: the American badger (*Taxidea taxus*), black-tailed jackrabbit (*Lepus californicus*), bobcat (*Lynx rufus*), coyote (*Canis latrans*, common), desert cottontail (*Sylvilagus audubonii*), gray fox (*Urocyon cinereoargenteus*), kit fox (*Vulpes macrotis*), and red fox (*Vulpes vulpes*), and (3) small nongame species: Botta's pocket gopher (*Thomomys bottae*), cactus mouse (*Peromyscus eremicus*), canyon mouse (*P. crinitis*), deer mouse (*P. maniculatus*), desert kangaroo rat (*Dipodomys deserti*), desert shrew (*Notiosorex crawfordi*), desert woodrat (*Neotoma lepida*), little pocket mouse (*Perognathus longimembris*), Merriam's pocket mouse (*Dipodomys merriami*), northern grasshopper mouse (*Onychomys leucogaster*), southern grasshopper mouse (*O. torridus*), and white-tailed antelope squirrel (*Ammospermophilus leucurus*). Bat species that may occur within the area of the SEZ include the big brown bat (*Eptesicus fuscus*), Brazilian free-tailed bat (*Tadarida brasiliensis*), California myotis (*Myotis californicus*), hoary bat (*Lasiurus cinereus*), long-legged myotis (*M. volans*), silver-haired bat (*Lasionycteris noctivagans*), and western pipistrelle (*Parastrellus hesperus*).

#### *11.6.11.3.2 Impacts*

As presented in the Draft Solar PEIS, solar energy development within the proposed Gold Point SEZ could affect potentially suitable habitats of mammal species. The analysis presented in the Draft Solar PEIS indicated that development would result in a small overall impact on all representative mammal species analyzed (Table 11.6.11.3-1 in the Draft Solar PEIS). The reduction in the developable area of the Gold Point SEZ would result in reduced habitat impacts for all representative mammal species; resultant impact levels for all representative mammal species would still be small. This conclusion also applies to mapped year-round pronghorn habitat that occurs within the Gold Point SEZ.

#### *11.6.11.3.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on mammal species are described in Section A.2.2 of Appendix A of this Final Solar PEIS. With implementation of required programmatic design features, impacts on mammal species are anticipated to be small.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, the following SEZ-specific design features for mammals have been identified:

- The fencing around the solar energy development should not block the free movement of mammals, particularly big game species.

- Wash and playa habitats should be avoided. The major wash (significant unnamed intermittent stream) in the SEZ has been identified as a non-development area, but other avoidable washes may exist within the SEZ.

If these SEZ-specific design features are implemented in addition to required programmatic design features, impacts on mammal species would be small. The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.6.11.4 Aquatic Biota

#### *11.6.11.4.1 Affected Environment*

There are no perennial streams or water bodies present in the proposed Gold Point SEZ. Updates to the Draft Solar PEIS include the following:

- The intermittent stream that runs through the center of the SEZ has been identified as a non-development area.

- The route of a new transmission line described in the Draft Solar PEIS is no longer assumed, and it is therefore not assumed to cross over Jackson Wash.

Aquatic biota present in the surface water features in the Gold Point SEZ have not been characterized. As stated in Appendix C of the Supplement to the Draft Solar PEIS, site surveys can be conducted at the project-specific level to characterize the aquatic biota, if present, within the SEZ.

#### *11.6.11.4.2 Impacts*

The types of impacts that could occur on aquatic habitats and biota from the development of utility-scale solar energy facilities are discussed in Section 5.10.3 of the Draft and Final Solar PEIS. Aquatic habitats present on or near the Gold Point SEZ could be affected by solar energy development in a number of ways, including (1) direct disturbance, (2) deposition of sediments, (3) changes in water quantity, and (4) degradation of water quality. The impact assessment provided in the Draft Solar PEIS remains valid, with the following updates:

- The intermittent wash running through the center of the SEZ has been identified as a non-development area; therefore, it would not be directly affected by construction activities. However, as described in the Draft Solar

PEIS, it could be affected indirectly by solar development activities within the SEZ.

- The transmission line corridor described in the Draft Solar PEIS is no longer assumed for the Gold Point SEZ. Therefore, Jackson Wash may not be directly affected by a stream crossing associated with a new transmission line.

#### *11.6.11.4.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on aquatic biota are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific conditions will be considered when programmatic design features are applied, for example:

- Appropriate engineering controls shall be implemented to minimize the amount of contaminants and sediment entering the unnamed intermittent stream within the SEZ.

It is anticipated that the implementation of the programmatic design features will reduce impacts on aquatic biota, and if the utilization of water from groundwater or surface water sources is adequately controlled to maintain sufficient water levels in nearby aquatic habitats, the potential impacts on aquatic biota from solar energy development at the Gold Point SEZ would be small.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features for aquatic biota have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.6.12 Special Status Species

### 11.6.12.1 Affected Environment

As presented in the Draft Solar PEIS, 21 special status species were identified that could occur or have potentially suitable habitat within the affected area of the proposed Gold Point SEZ. Since publication of the Draft Solar PEIS, eight additional special status species have been identified that could potentially occur in the affected area based on county-level occurrences and the presence of potentially suitable habitat. These eight special status species are all designated sensitive species by the Nevada BLM office and include (1) birds: golden eagle, loggerhead shrike, and long-eared owl; and (2) mammals: big brown bat, California myotis, hoary bat, long-legged myotis, and western pipistrelle. These additional species are discussed below.

**Golden Eagle.** The golden eagle is an uncommon to common permanent resident in southern Nevada. This species was not analyzed for the Gold Point SEZ in the Draft Solar PEIS. The species inhabits rolling foothills, mountain areas, and desert shrublands. It nests on cliff faces and in large trees in open areas. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land cover types, there is no suitable nesting habitat within the SEZ, but approximately 350 acres (1.5 $km^2$) of cliff and rock outcrop habitat that may be potentially suitable nesting habitat occurs in the area of indirect effects.

**Loggerhead Shrike.** The loggerhead shrike is a common winter resident in lowlands and foothills of southern Nevada. This species was not analyzed for the Gold Point SEZ in the Draft Solar PEIS. The species occurs in open habitats with shrubs, trees, utility lines, or other perches. The highest densities of this species occur in open-canopied foothill forests. On the basis of an evaluation of the SWReGAP habitat suitability model for this species, potentially suitable foraging habitat for the loggerhead shrike may occur on the SEZ and throughout the area of indirect effects (Table 11.6.12.1-1).

**Long-Eared Owl.** The long-eared owl is an uncommon year-round resident in southern Nevada. This species was not analyzed for the Gold Point SEZ in the Draft Solar PEIS. The species inhabits desert shrubland environments in proximity to riparian areas such as desert washes. It nests in trees using old nests from other birds or squirrels. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable nesting habitat (forests) does not occur on the SEZ. However, approximately 80 acres (0.3 $km^2$) of woodland habitat (pinyon-juniper) that may be potentially suitable nesting habitat occurs in the area of indirect effects.

**Big Brown Bat.** The big brown bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Gold Point SEZ in the Draft Solar PEIS. The big brown bat is uncommon in desert habitats but may occur in desert shrublands in close proximity to water sources. The species inhabits desert shrubland environments in proximity to riparian areas such as desert washes. It roosts in buildings, caves, mines, and trees. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur on the SEZ. However, approximately 80 acres (0.3 $km^2$) of woodland habitat (pinyon-juniper) and 350 acres (1.5 $km^2$) of cliff and rock outcrop habitat that may be potentially suitable roosting habitat occur in the area of indirect effects.

**California Myotis.** The California myotis is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Gold Point SEZ in the Draft Solar PEIS. The species inhabits desert, chaparral, woodlands, and forests. It roosts primarily in crevices but

**TABLE 11.6.12.1-1 Habitats, Potential Impacts, and Potential Mitigation for Special Status Species That Could Be Affected by Solar Energy Development on the Proposed Gold Point SEZ as Revised[a]**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Maximum Area of Potential Habitat Affected[d]: Outside SEZ (Indirect Effects)[f] | Overall Impact Magnitude[g] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Birds*** | | | | | | |
| Golden eagle | *Aquila chrysaetos* | BLM-S | An uncommon to common permanent resident and migrant in southern Nevada. Habitat includes rolling foothills, mountain areas, and desert shrublands. Nests on cliff faces and in large trees in open areas. About 3,330,000 acres[i] of potentially suitable habitat occurs within the SEZ region. | 4,500 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) | 87,950 acres of potentially suitable habitat (2.6% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| Loggerhead shrike | *Lanius ludovicianus* | BLM-S | A common winter resident in lowlands and foothills in southern Nevada. Prefers open habitats with shrubs, trees, utility lines, or other perches. Highest density occurs in open-canopied foothill forests. About 3,300,000 acres of potentially suitable habitat occurs within the SEZ region. | 4,490 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) | 88,000 acres of potentially suitable habitat (2.7% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| Long-eared owl | *Asio otus* | BLM-S | An uncommon yearlong resident in southern Nevada. Occurs in desert shrubland environments in proximity to riparian areas such as desert washes. Nests in trees using old nests from other birds or squirrels. About 3,210,000 acres of potentially suitable habitat occurs within the SEZ region. | 4,500 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) | 87,700 acres of potentially suitable habitat (2.7% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |

**TABLE 11.6.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Maximum Area of Potential Habitat Affected[d]: Outside SEZ (Indirect Effects)[f] | Overall Impact Magnitude[g] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Mammals*** | | | | | | |
| Big brown bat | *Eptesicus fuscus* | BLM-S | Occurs throughout the southwestern United States in various habitat types. Uncommon in hot desert environments but may occur in areas in close proximity to water sources such as lakes and washes. Roosts in buildings, caves, mines, and trees. About 2,350,000 acres of potentially suitable habitat occurs within the SEZ region. | 4,560 acres of potentially suitable habitat lost (0.2% of available potentially suitable habitat) | 63,400 acres of potentially suitable habitat (2.7% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| California myotis | *Myotis californicus* | BLM-S | A common year-round resident in southern Nevada. Occurs in a variety of habitats, including desert, chaparral, woodlands, and forests. Roosts primarily in crevices but will also use buildings, mines, and hollow trees. About 2,400,000 acres of potentially suitable habitat occurs within the SEZ region. | 4,570 acres of potentially suitable habitat lost (0.2% of available potentially suitable habitat) | 75,000 acres of potentially suitable habitat (3.1% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| Hoary bat | *Lasiurus cinereus* | BLM-S | The most widespread North American bat species, occurs throughout southern Nevada in various habitat types. Occurs in habitats such as woodlands, foothills, desert shrublands, and chaparral. Roosts primarily in trees. About 780,000 acres of potentially suitable habitat occurs within the SEZ region. | 250 acres of potentially suitable habitat lost (<0.1% of available potentially suitable habitat) | 8,400 acres of potentially suitable habitat (1.1% of available suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |

**TABLE 11.6.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d] Within SEZ (Direct Effects)[e] | Outside SEZ (Indirect Effects)[f] | Overall Impact Magnitude[g] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Mammals (Cont.)*** | | | | | | |
| Long-legged myotis | | BLM-S | Common to uncommon year-round resident in southern Nevada. Uncommon in desert and arid grassland environments. Most common in woodlands above 4,000 ft[j] elevation. Forages in chaparral, scrub, woodlands, and desert shrublands. Roosts in trees, caves, and crevices. About 2,300,000 acres of potentially suitable habitat occurs within the SEZ region. | 4,550 acres of potentially suitable habitat lost (0.2% of available potentially suitable habitat) | 63,400 acres of potentially suitable habitat (2.8% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| Western pipistrelle | *Pipistrellus Hesperus* | BLM-S | A common year-round resident of deserts, grasslands, and woodlands in southern Nevada. Occurs in various habitats including mountain foothill woodlands, desert shrublands, desert washes, and pinyon-juniper woodlands. Roosts primarily in rock crevices; occasionally in mines and caves. About 3,270,000 acres of potentially suitable habitat occurs within the SEZ region. | 4,570 acres of potentially suitable habitat lost (0.1% of available potentially suitable habitat) | 88,000 acres of potentially suitable habitat (2.7% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |

a The species presented in this table represent new species identified following publication of the Draft Solar PEIS or a re-evaluation of those species that were determined to have moderate or large impacts in the Draft Solar PEIS. The other special status species for this SEZ are identified in Table 11.6.12.1-1 of the Draft Solar PEIS.

b BLM-S = listed as sensitive by the BLM.

**Footnotes continued on next page.**

**TABLE 11.6.12.1-1 (Cont.)**

[c] Potentially suitable habitat was determined using SWReGAP habitat suitability models (USGS 2004, 2007). Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[d] Maximum area of potentially suitable habitat that could be affected relative to availability within the SEZ region. Habitat availability for each species within the region was determined by using SWReGAP habitat suitability models (USGS 2004, 2007). This approach probably overestimates the amount of suitable habitat in the project area.

[e] Direct effects within the SEZ consist of the ground-disturbing activities associated with construction and the maintenance of an altered environment associated with operations.

[f] Area of indirect effects was assumed to be the area adjacent to the SEZ within 5 mi (8 km) of the SEZ boundary where ground-disturbing activities would not occur. Indirect effects include effects from surface runoff, dust, noise, lighting, and so on from project developments. The potential degree of indirect effects would decrease with increasing distance away from the SEZ.

[g] Overall impact magnitude categories were based on professional judgment and are as follows: (1) small: <1% of the population or its habitat would be lost and the activity would not result in a measurable change in carrying capacity or population size in the affected area; (2) moderate: >1 but <10% of the population or its habitat would be lost and the activity would result in a measurable but moderate (not destabilizing) change in carrying capacity or population size in the affected area; (3) large: >10% of a population or its habitat would be lost and the activity would result in a large, measurable, and destabilizing change in carrying capacity or population size in the affected area. Note that much greater weight was given to the magnitude of direct effects because those effects would be difficult to mitigate. Design features would reduce most indirect effects to negligible levels.

[h] Species-specific mitigations are suggested here, but final mitigations should be developed in consultation with state and federal agencies and should be based on pre-disturbance surveys.

[i] To convert acres to $km^2$, multiply by 0.004047.

[j] To convert ft to m, multiply by 0.3048.

will also use buildings, mines, and hollow trees. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur on the SEZ or area of indirect effects (Table 11.6.12.1-1). However, approximately 80 acres (0.3 $km^2$) of woodland habitat (pinyon-juniper) and 350 acres (1.5 $km^2$) of cliff and rock outcrop habitat that may be potentially suitable roosting habitat occurs in the area of indirect effects.

**Hoary Bat.** The hoary bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Gold Point SEZ in the Draft Solar PEIS. The species inhabits woodlands, foothills, desert shrublands, and chaparral. It roosts primarily in trees. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests) does not occur on the SEZ (Table 11.6.12.1-1). However, approximately 80 acres (0.3 $km^2$) of woodland habitat (pinyon-juniper) that may be potentially suitable roosting habitat occurs in the area of indirect effects.

**Long-Legged Myotis.** The long-legged myotis is a common to uncommon year-round resident in southern Nevada. This species was not analyzed for the Gold Point SEZ in the Draft Solar PEIS. This species is uncommon in desert and arid grassland environments and most common in woodlands above 4,000-ft (1,219-m) elevation. It forages in chaparral, scrub, woodlands, and desert shrublands and roosts in trees, caves, and crevices. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur on the SEZ. However, approximately 80 acres (0.3 $km^2$) of woodland habitat (pinyon-juniper) and 350 acres (1.5 $km^2$) of cliff and rock outcrop habitat that may be potentially suitable roosting habitat occur in the area of indirect effects.

**Western Pipistrelle.** The western pipistrelle is a common year-round resident in southern Nevada. This species was not analyzed for the Gold Point SEZ in the Draft Solar PEIS. The species inhabits mountain foothill woodlands, desert shrublands, desert washes, and pinyon-juniper woodlands. It roosts primarily in rock crevices and occasionally in mines and caves. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (rock outcrops) does not occur on the SEZ. However, approximately 350 acres (1.5 $km^2$) of cliff and rock outcrop habitat that may be potentially suitable roosting habitat occurs in the area of indirect effects.

### 11.6.12.2 Impacts

Overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the special status species' habitat within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of the special status species' habitat would be lost; and (3) *large*: >10% of the special status species' habitat would be lost.

As presented in the Draft Solar PEIS, solar energy development within the Gold Point SEZ could affect potentially suitable habitats of special status species. The analysis presented in the Draft Solar PEIS for the Gold Point SEZ indicated that development would result in no impact or a small overall impact on all special status species, with the exception of the Eastwood milkweed (*Asclepias eastwoodiana*) (Table 11.6.12.1-1 in the Draft Solar PEIS). Development within the Gold Point SEZ could still affect the same 21 species evaluated in the Draft Solar PEIS; however, the reduction in the developable area would result in reduced (and still small) impact levels compared to original estimates in the Draft Solar PEIS. Impacts on the Eastwood milkweed were determined to range from small to large depending on the availability of suitable desert wash habitat, which could not be quantified prior to the Final Solar PEIS. Pre-disturbance surveys will be required to determine the observed locations and habitat suitability of the SEZ for the Eastwood milkweed.

In addition, impacts on the eight BLM-designated sensitive species that were not evaluated for the Gold Point SEZ in the Draft Solar PEIS are discussed below and in Table 11.6.12.1-1. The impact assessment for these additional species was carried out in the same way as for those species analyzed in the Draft Solar PEIS (Section 11.6.12.2 of the Draft Solar PEIS).

**Golden Eagle.** The golden eagle was not analyzed for the Gold Point SEZ in the Draft Solar PEIS. This species is an uncommon to common permanent resident in southern Nevada, and potentially suitable foraging habitat is expected to occur in the affected area of the Gold Point SEZ as revised. Approximately 4,500 acres (18 km$^2$) of potentially suitable foraging habitat on the SEZ could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents 0.1% of potentially suitable habitat in the SEZ region. About 87,950 acres (356 km$^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.6% of the available suitable foraging habitat in the SEZ region (Table 11.6.12.1-1). Most of this area could serve as foraging habitat (open shrublands). On the basis of an evaluation of SWReGAP land cover types, there is no suitable nesting habitat within the SEZ, but approximately 350 acres (1.5 km$^2$) of cliff and rock outcrop habitat that may be potentially suitable nesting habitat occurs in the area of indirect effects.

The overall impact on the golden eagle from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point SEZ is considered small, because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents less than 1% of potentially suitable foraging habitat in the SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of direct impacts on all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the golden eagle, because potentially suitable shrubland is widespread throughout the area of direct effects and is readily available in other portions of the affected area.

**Loggerhead Shrike.** The loggerhead shrike was not analyzed for the Gold Point SEZ in the Draft Solar PEIS. This species is a common winter resident in lowlands and foothills of southern Nevada. Approximately 4,490 acres (18 $km^2$) of potentially suitable foraging habitat on the SEZ could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents 0.1% of potentially suitable habitat in the SEZ region. About 88,000 acres (356 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.7% of the available suitable foraging habitat in the SEZ region (Table 11.6.12.1-1).

The overall impact on the loggerhead shrike from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point SEZ is considered small, because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents less than 1% of potentially suitable foraging habitat in the SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of direct impacts on all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the loggerhead shrike, because potentially suitable shrubland is widespread throughout the area of direct effects and readily available in other portions of the affected area.

**Long-Eared Owl.** The long-eared owl was not analyzed for the Gold Point SEZ in the Draft Solar PEIS. This species is an uncommon to common permanent resident in southern Nevada, and potentially suitable foraging habitat is expected to occur in the affected area of the Gold Point SEZ. Approximately 4,500 acres (18 $km^2$) of potentially suitable foraging habitat could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents 0.1% of potentially suitable habitat in the SEZ region. About 87,700 acres (355 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.7% of the available suitable foraging habitat in the SEZ region (Table 11.6.12.1-1).

The overall impact on the long-eared owl from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point SEZ is considered small, because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents less than 1% of potentially suitable foraging habitat in the SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of direct impacts on all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the long-eared owl, because potentially suitable shrubland is widespread throughout the area of direct effects and readily available in other portions of the affected area.

**Big Brown Bat.** The big brown bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Gold Point SEZ in the Draft Solar PEIS. Suitable roosting habitat (caves, forests, and buildings) is not expected to occur on the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 4,560 acres (18 $km^2$) of potentially suitable foraging habitat could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents about 0.2% of potentially suitable foraging habitat in the region. About 63,400 acres (257 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.7% of the available suitable foraging habitat in the region (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur on the SEZ. However, approximately 80 acres (0.3 $km^2$) of woodland habitat (pinyon-juniper) and 350 acres (1.5 $km^2$) of cliff and rock outcrop habitat that may be potentially suitable roosting habitat occur in the area of indirect effects.

The overall impact on the big brown bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

**California Myotis.** The California myotis is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Gold Point SEZ in the Draft Solar PEIS. Suitable roosting habitat (forests and rock outcrops) is not expected to occur on the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 4,570 acres (18 $km^2$) of potentially suitable foraging habitat could be directly affected by construction and operations (Table 11.6.12.1-1). This direct impact area represents about 0.2% of potentially suitable foraging habitat in the region. About 75,000 acres (304 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 3.1% of the available suitable foraging habitat in the region (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur on the SEZ or area of indirect effects (Table 11.6.12.1-1). However, approximately 80 acres (0.3 $km^2$) of woodland habitat (pinyon-juniper) and 350 acres (1.5 $km^2$) of cliff and rock outcrop habitat that may be potentially suitable roosting habitat occur in the area of indirect effects.

The overall impact on the California myotis from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

**Hoary Bat.** The hoary bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Gold Point SEZ in the Draft Solar PEIS. Suitable roosting habitat (forests) is not expected to occur on the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 250 acres (1 $km^2$) of potentially suitable foraging habitat on the SEZ could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents less than 0.1% of potentially suitable foraging habitat in the region. About 8,400 acres (34 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 1.1% of the available suitable foraging habitat in the region (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests) does not occur on the SEZ (Table 11.6.12.1-1). However, approximately 80 acres (0.3 $km^2$) of woodland habitat (pinyon-juniper) that may be potentially suitable roosting habitat occurs in the area of indirect effects.

The overall impact on the hoary bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

**Long-Legged Myotis.** The long-legged myotis is a common to uncommon year-round resident in southern Nevada. This species was not analyzed for the Gold Point SEZ in the Draft Solar PEIS. Suitable roosting habitat (forests and rock outcrops) is not expected to occur on the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 4,550 acres (18 $km^2$) of potentially suitable foraging habitat on the SEZ could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents about 0.2% of potentially suitable foraging habitat in the region. About 63,400 acres (257 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.8% of the available suitable foraging habitat in the region (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur on the SEZ. However, approximately 80 acres (0.3 $km^2$) of woodland habitat (pinyon-juniper) and 350 acres (1.5 $km^2$) of cliff and rock outcrop habitat that may be potentially suitable roosting habitat occur in the area of indirect effects.

The overall impact on the long-legged myotis from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

**Western Pipistrelle.** The western pipistrelle is a common year-round resident in southern Nevada. This species was not analyzed for the Gold Point SEZ in the Draft Solar PEIS. Suitable roosting habitat (forests and rock outcrops) is not expected to occur on the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 4,570 acres (18 $km^2$) of potentially suitable foraging habitat on the SEZ could be directly affected by construction and operations (Table 11.6.12.1-1). This direct effects area represents about 0.1% of potentially suitable foraging habitat in the region. About 88,000 acres (356 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.7% of the available suitable foraging habitat in the region (Table 11.6.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable roosting habitat (forests and rock outcrops) exists within the SEZ or within the area of indirect effects.

The overall impact on the western pipistrelle from construction, operation, and decommissioning of utility-scale solar energy facilities within the Gold Point SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

#### 11.6.12.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific conditions will be considered when programmatic design features are applied, for example:

- Pre-disturbance surveys shall be conducted within the SEZ to determine the presence and abundance of special status species, including those identified in Table 11.6.12.1-1 of the Draft Solar PEIS as well as those identified in Table 11.6.12.1-1 of this Final Solar PEIS. Disturbance to occupied habitats for these species shall be avoided or minimized to the extent practicable. If avoiding or minimizing impacts on occupied habitats is not possible, translocation of individuals from areas of direct effects or compensatory mitigation of direct effects on occupied habitats may be used to reduce impacts. A comprehensive mitigation strategy for special status species that uses one or more of these options to offset the impacts of development shall be developed in coordination with the appropriate federal and state agencies.

- Avoiding or minimizing disturbance to desert wash, playa, and sagebrush habitats to reduce or eliminate impacts on two special status species.

- Coordination with the USFWS and the NDOW shall be conducted for the greater sage-grouse (*Centrocercus urophasianus*)—a candidate species for listing under the ESA. Coordination would identify an appropriate survey protocol and mitigation requirements, which may include avoidance, minimization, translocation, or compensation.

It is anticipated that the implementation of these programmatic design features will reduce the majority of impacts on the special status species from habitat disturbance and groundwater use.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features have been identified for special status species. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.6.13 Air Quality and Climate

### 11.6.13.1 Affected Environment

Except as noted below, the information for air quality and climate presented for the affected environment of the Draft Solar PEIS remains essentially unchanged.

#### *11.6.13.1.1 Existing Air Emissions*

The Draft Solar PEIS presented emissions data for Esmeralda County for 2002. More recent data for 2008 (EPA 2011a) were reviewed for this Final Solar PEIS. The two emissions inventories used different sources and assumptions. For example, the 2008 data did not include biogenic emissions. All emissions were lower in the more recent data. These changes would not affect the modeled air quality impacts presented in this update.

#### *11.6.13.1.2 Air Quality*

The calendar quarterly average NAAQS of 1.5 $\mu g/m^3$ for lead (Pb) presented in Table 11.6.13.1-2 of the Draft Solar PEIS has been replaced by the rolling 3-month standard (0.15 $\mu g/m^3$). The federal 24-hour and annual $SO_2$ and 1-hour $O_3$ standards have been revoked as well (EPA 2011b). These changes will not affect the modeled air quality impacts presented here. The Nevada SAAQS have not been changed.

### 11.6.13.2 Impacts

#### *11.6.13.2.1 Construction*

**Methods and Assumptions**

Except as noted below, the methods and modeling assumptions are the same as those presented in the Draft Solar PEIS. The developable area of the proposed Gold Point SEZ was reduced by about 4%, from 4,810 acres (19.5 km$^2$) to 4,596 acres (18.6 km$^2$), a change too small to affect the results presented here. Given this small change, remodeling was not warranted, and the modeled air quality impacts and conclusions presented in the Draft Solar PEIS (as summarized below) remain valid.[1]

**Results**

Predicted 24-hour and annual $PM_{10}$ and 24-hour $PM_{2.5}$ concentration levels could exceed the standard levels at the SEZ boundaries and in the immediate surrounding areas during the construction of solar facilities. To reduce potential impacts on ambient air quality and in compliance with programmatic design features, aggressive dust control measures would be used. Potential particulate air quality impacts on nearby communities would not exceed standard levels. Impacts from construction activities are not anticipated to exceed Class I PSD $PM_{10}$ increments at the nearest federal Class I area (John Muir WA in California). Construction activities are not subject to the PSD program, and the comparison provides only a screen for gauging the magnitude of the impact. Accordingly, it is anticipated that impacts of construction activities on ambient air quality would be moderate and temporary.

Given the small areal change, emissions from construction equipment and vehicles would be almost the same as those identified in the Draft Solar PEIS. Any potential impacts on AQRVs at nearby federal Class I areas would be about the same as those estimated in the Draft Solar PEIS, and the conclusions there remain valid. Construction-related emissions are temporary in nature and thus would cause some unavoidable but short-term impacts.

[1] At this programmatic level, detailed information on construction activities, such as facility size, type of solar technology, heavy equipment fleet, activity level, work schedule, and the like, is not known; thus air quality modeling cannot be conducted. Therefore, it has been assumed that an area of 3,000 acres (12.14 km$^2$) in total would be disturbed continuously; thus the modeling results and discussion here should be interpreted in that context. During the site-specific project phase, more detailed information would be available and more realistic air quality modeling analysis could be conducted. It is likely that predicted impacts on ambient air quality for specific projects would be much lower than those in this Final Solar PEIS.

#### *11.6.13.2.2 Operations*

The reduction in developable area of the Gold Point SEZ by about 4% reduces the generation capacity and annual power generation by a similar percentage and thus reduces the potentially avoided emissions presented in the Draft Solar PEIS. Updated estimates for emissions potentially avoided by full solar development of the proposed Gold Point SEZ can be obtained from the table in the Draft Solar PEIS by reducing the tabulated emissions shown in Table 11.6.13.2-2 of the Draft Solar PEIS by 4.4%. For example, depending on the technology used, up to 866 tons per year of $NO_x$ (= 95.6% × the lower-end value of 906 tons/yr tabulated in the Draft Solar PEIS) could be avoided by full solar development of the proposed Gold Point SEZ as revised. These tabulated results are consistent with, but slightly smaller than, the results presented in the Draft Solar PEIS. Solar facilities built in the Gold Point SEZ could be more important than those built in other states in terms of reducing fuel combustion–related emissions.

#### *11.6.13.2.3 Decommissioning and Reclamation*

The discussion in the Draft Solar PEIS remains valid. Decommissioning and reclamation activities would be of short duration, and their potential impacts would be moderate and temporary.

### 11.6.13.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce air quality impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Limiting dust generation during construction and operations is a required programmatic design feature under the BLM Solar Energy Program. These extensive fugitive dust control measures would keep off-site PM levels as low as possible during construction.

On the basis of impact analyses conducted for the Draft Solar and consideration of comments received as applicable, no SEZ-specific design features for air quality have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.6.14 Visual Resources

### 11.6.14.1 Affected Environment

No boundary revisions were identified for the proposed SEZ within the Supplement to the Draft Solar PEIS; however, a non-development area was identified. For the proposed SEZ, 214 acres (0.87 $km^2$) along a significant unnamed intermittent stream passing east–west through the center of the SEZ was identified as a non-development area. The remaining developable area within the SEZ is 4,596 acres (18.6 $km^2$).

VRI information was not available at the time of publication of the Draft Solar PEIS. Since that time, VRI data have been collected and finalized. A map for the SEZ and surrounding lands is shown in Figure 11.6.14.1-1; it provides information collected in BLM's 2010 and 2011 VRI, which was finalized in October 2011 (BLM 2011b). As shown, the VRI values for the SEZ are primarily VRI Class IV, indicating low visual values; however, a portion at the southern end of the SEZ is VRI Class II, indicating relatively high visual values. The inventory indicates moderate scenic quality for the SEZ and its immediate surroundings. Positive scenic quality attributes included its vegetation, color, and adjacent scenery. The Lida Valley is characterized as a typical flat-bottomed area. The inventory indicates low sensitivity for the SEZ. However, immediately to the south of the SEZ, the town of Gold Point is located within an area characterized as highly sensitive due to the presence of the old mining town.

In accordance with the collected VRI information, lands in the Battle Mountain District Office within the 25-mi (40-km), 650-ft (198-m) viewshed of the SEZ include 48,146 acres (195.9 $km^2$) of VRI Class II areas; 26,458 acres (107.1 $km^2$) of VRI Class III areas; and 133,607 acres (540.7 $km^2$) of VRI Class IV areas.

As indicated in the Draft Solar PEIS, the Tonopah RMP (BLM 1997) indicates that the SEZ and surrounding area are managed as VRM Class IV, which permits major modification of the existing character of the landscape. Since the publication of the Draft Solar PEIS, the Battle Mountain District Office has been preparing a new comprehensive RMP and associated EIS. The RMP/EIS will replace the existing 1997 Tonopah RMP and 1986 Shoshone-Eureka RMP. The RMP revision process began in December 2010 (BLM 2011a).

### 11.6.14.2 Impacts

The summary of impacts provided in the Draft Solar PEIS remains valid, as follows. Development within the SEZ could create a visually complex landscape that would contrast strongly with the strongly horizontal landscape of the flat valley in which the SEZ is located. Large visual impacts on the SEZ and surrounding lands within the SEZ viewshed would be associated with solar energy development within the proposed Gold Point SEZ because of major modification of the character of the existing landscape. The potential exists for additional impacts from construction and operation of transmission lines and access roads within and outside the SEZ.

Utility-scale solar energy development within the proposed Gold Point SEZ is likely to result in moderate visual contrasts for some viewpoints within the Queer Mountain WSA, which is within 7 mi (11 km) of the SEZ at the point of closest approach. Moderate visual contrast levels would also be expected for viewpoints on Magruder Mountain. Minimal to weak visual contrasts would be expected for some viewpoints within other sensitive visual resource areas within the SEZ 25-mi (40-km) viewshed.

Residents of the community of Gold Point would likely experience strong visual contrasts from solar energy development within the SEZ. About 18 mi (29 km) of State Route 266 are within the SEZ viewshed at distances of 2 to 9.5 mi (3.2 to 15.3 km) from the SEZ. Travelers on

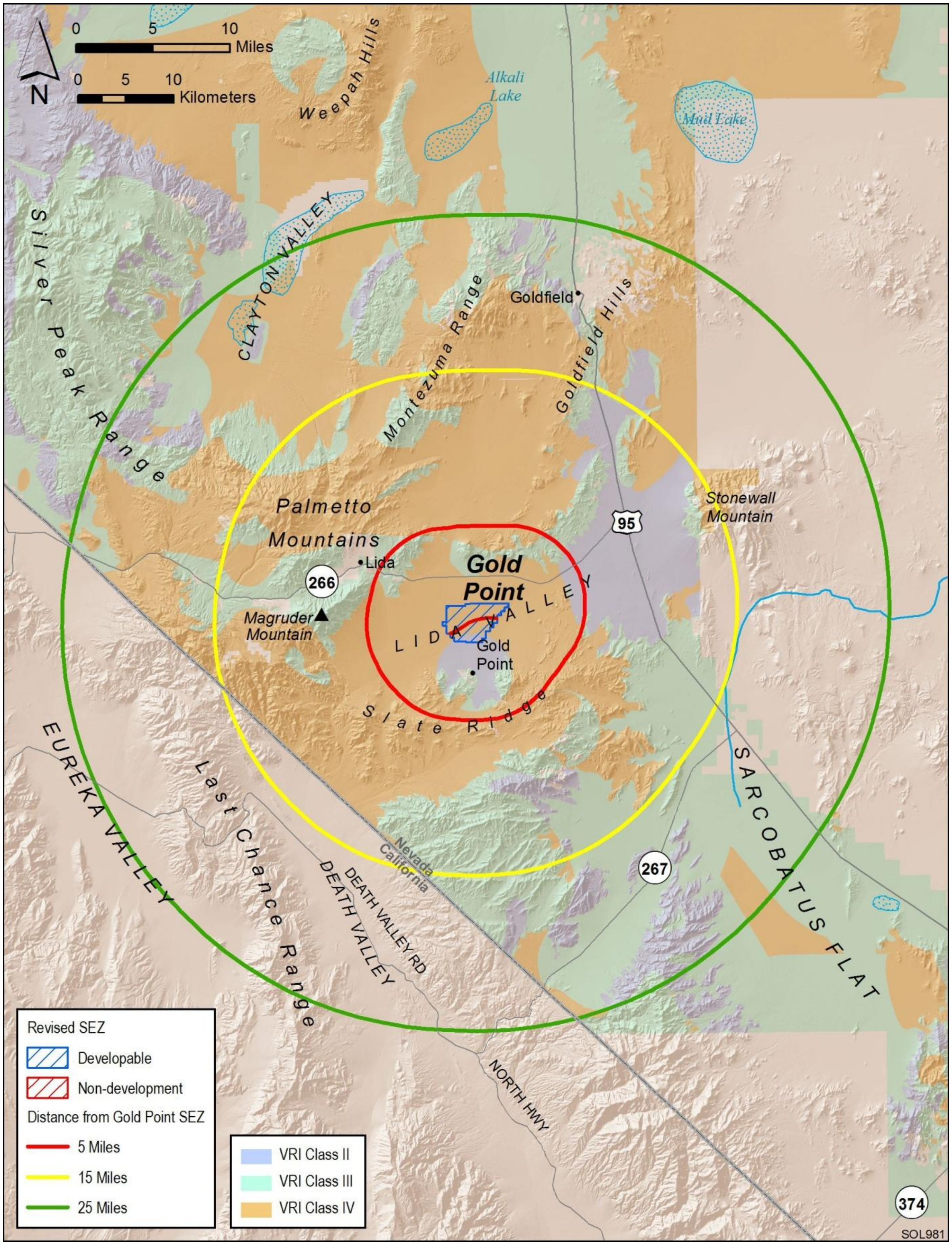


**FIGURE 11.6.14.1-1 Visual Resource Inventory Values for the Proposed Gold Point SEZ as Revised**

State Route 266 could be subjected to strong visual contrasts from solar energy development within the SEZ. Visitors to the area, workers, and residents of the community of Gold Point may experience visual impacts from solar energy facilities located within the SEZ (as well as any associated access roads and transmission lines) as they travel other area roads.

#### 11.6.14.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on visual resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. While application of the programmatic design features would reduce potential visual impacts somewhat, the degree of effectiveness of these design features could be assessed only at the site- and project-specific level. Given the large scale, reflective surfaces, and strong regular geometry of utility-scale solar energy facilities and the lack of screening vegetation and landforms within the SEZ viewshed, siting the facilities away from sensitive visual resource areas and other sensitive viewing areas would be the primary means of mitigating visual impacts. The effectiveness of other visual impact mitigation measures generally would be limited.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features to address impacts on visual resources have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.6.15 Acoustic Environment

#### 11.6.15.1 Affected Environment

The developable area of the proposed Gold Point SEZ was reduced by about 4% from 4,810 acres (19.5 km$^2$) to 4,596 acres (18.6 km$^2$); the boundaries of the SEZ were not changed, and thus the information for acoustic environment remains the same as presented in the Draft Solar PEIS.

#### 11.6.15.2 Impacts

##### *11.6.15.2.1 Construction*

Since the boundaries of the proposed Gold Point SEZ remain unchanged and the reduction in the developable area was small, the noise impacts from solar development in the proposed Gold Point SEZ remain the same as those presented in the Draft Solar PEIS. Construction within the SEZ would cause minimal unavoidable, but localized, short-term noise impacts on neighboring communities. No adverse vibration impacts are anticipated from construction activities, including pile driving for dish engines.

#### *11.6.15.2.2 Operations*

The conclusions presented in the Draft Solar PEIS remain valid. Operating parabolic trough or power tower facilities using TES could result in some adverse noise impacts on the nearest residences, depending on background noise levels and meteorological conditions. In the permitting process, refined noise propagation modeling considering topographical features might be warranted, along with measurement of background noise levels.

Noise from dish engines could cause some adverse impacts on the nearest residences, depending on background noise levels and meteorological conditions. Thus, consideration of minimizing noise impacts is very important in the siting of dish engine facilities. Direct mitigation of dish engine noise through noise control engineering could also be considered.

Small changes in the developable area of the proposed SEZ would not affect the discussions of vibration, transformer and switchyard noise, and transmission line corona discharge presented in the Draft Solar PEIS. Noise impacts from these sources would be negligible.

#### *11.6.15.2.3 Decommissioning and Reclamation*

The conclusions presented in the Draft Solar PEIS remain valid. Decommissioning and reclamation activities would be of short duration, and their potential noise impacts would be minor and temporary.

### 11.6.15.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce noise impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some protection from noise impacts.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, the following SEZ-specific design feature was identified for noise:

- Because of the differences in elevation between the proposed Gold Point SEZ and nearby residences to the south, refined modeling will be warranted along with background noise measurements as a part of project-specific analyses.

The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.6.16 Paleontological Resources

### 11.6.16.1 Affected Environment

Data provided in the Draft Solar PEIS remain valid, with the following update:

- The BLM Regional Paleontologist may have additional information on the paleontological potential of the SEZ and be able to verify the PFYC of the SEZ as Class 2 as used in the Draft Solar PEIS.

### 11.6.16.2 Impacts

The assessment provided in the Draft Solar PEIS remains valid. Few, if any, impacts on significant paleontological resources are likely to occur in the proposed Gold Point SEZ. However, a more detailed look at the geological deposits of the SEZ is needed to determine whether a paleontological survey is warranted.

### 11.6.16.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on paleontological resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Impacts would be minimized through the implementation of required programmatic design features, including a stop-work stipulation in the event that paleontological resources are encountered during construction, as described in Section A.2.2 of Appendix A.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features for paleontological resources have been identified. If the geologic deposits in the proposed Gold Point SEZ are determined to be thick alluvial deposits as described in Section 11.6.16.1 of the Draft Solar PEIS and are classified as PFYC Class 2, mitigation of paleontological resources within the SEZ is not likely to be necessary. The need for and nature of any SEZ-specific design features would depend on the results of future paleontological investigations. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

As additional information on paleontological resources (e.g., from regional paleontologists or from new surveys) becomes available, the BLM will post the data to the project Web site (http://solareis.anl.gov) for use by applicants, the BLM, and other stakeholders.

## 11.6.17 Cultural Resources

### 11.6.17.1 Affected Environment

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- A tribally approved ethnographic study of the proposed Gold Point SEZ was conducted with the Timbisha Shoshone Tribe (SWCA and University of Arizona 2011), and a summary of that study was presented in the Supplement to the Draft Solar PEIS. Important ceremonial areas near the SEZ include Pigeon Spring and possibly Indian Spring, as well as Doctor Rock and Red Volcano. Culturally important geologic features in the vicinity of the SEZ include Mount Jackson, Stonewall Mountain, Magruder Mountain, Mount Jackson Ridge, Tule Canyon, and Mount Dunfee. Tribal members acknowledged that numerous trail systems intersect the Gold Point study area. The completed ethnographic study is available in its entirety on the Solar PEIS Web site (http://solareis.anl.gov)

- Additional information to characterize the area surrounding the proposed SEZ may be available in the future (after the Final Solar PEIS has been completed), as follows:
  - Results of a Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ, (2) trail networks through existing ethnographic reports, and (3) overall cultural sensitivity of the landscape.
  - Results of a Class II stratified random sample survey of 230 acres (0.9 km$^2$) or roughly 5% of the SEZ. The Class II survey is being conducted by the BLM to meet its ongoing Section 110 responsibilities under the NHPA. The objectives of the Class II surveys currently under contract are to reliably predict the density, diversity, and distribution of archaeological sites within each SEZ in Arizona, California, and Nevada and create sensitivity zones based on projected site density, complexity, likely presence of human burials, and/or other tribal concerns. The BLM will continue to request funding to support additional Class II sample inventories in the SEZ areas. Areas of interest, such as historic resources pertaining to mining, as determined through a Class I review, and, if appropriate, some subsurface testing of dune and/or colluvium areas should be considered in sampling strategies for future surveys.
  - Continuation of government-to-government consultation as described in Section 2.4.3 of the Supplement to the Draft Solar PEIS and IM 2012-032 (BLM 2011c) may be continued, including follow-up to recent ethnographic studies covering some SEZs in Nevada and Utah with tribes not included in the original studies to determine whether those tribes have similar concerns.

### 11.6.17.2 Impacts

As stated in the Draft Solar PEIS, impacts on significant cultural resources could occur in the proposed Gold Point SEZ; however, further investigation is needed. For this updated analysis, impacts on the Goldfield Historic District are no longer projected, because a new transmission line close to that area is no longer assumed. However, on the basis of the new ethnographic study, impacts on Native American trail networks are possible.

### 11.6.17.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on cultural resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Programmatic design features assume that the necessary surveys, evaluations, and consultations will occur. Design features for visual resources would also reduce some impacts on cultural resources, especially for the Gold Point Town site.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features for cultural resources have been identified. SEZ-specific design features would be determined in consultation with the Nevada SHPO and affected tribes and would depend on the results of future investigations. Information in the ethnographic reports would suggest that impacts on Pigeon Spring, Doctor Rock, Red Volcano, Mount Jackson, Stonewall Mountain, Magruder Mountain, Mount Jackson Ridge, Tule Canyon, and Mount Dunfee, trail systems, and culturally sensitive plant and animal species would need to be avoided, minimized, or otherwise mitigated if solar energy development were to be initiated in the proposed Gold Point SEZ. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.6.18 Native American Concerns

### 11.6.18.1 Affected Environment

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- A tribally approved ethnographic study of the proposed Gold Point SEZ and surrounding landscape was conducted with the Timbisha Shoshone Tribe (SWCA and University of Arizona 2011), and a summary of that study was presented in the Supplement to the Draft Solar PEIS. Important ceremonial areas identified near the SEZ include Pigeon Spring and possibly Indian Spring, as well as Doctor Rock and Red Volcano. Culturally important geologic features in the vicinity of the SEZ include Mount Jackson, Stonewall Mountain, Magruder Mountain, Mount Jackson Ridge, Tule Canyon, and Mount Dunfee. Tribal members acknowledged that numerous trail systems intersect the Gold Point study area, and several culturally important plant and animal species. The completed ethnographic study is available in its entirety on the Solar PEIS Web site (http://solareis.anl.gov).

- The tribal representatives from the Timbisha Shoshone Tribe believe that all cultural resources and landscapes within and surrounding the proposed Gold Point SEZ are important in helping the tribes understand their past, present, and future.

- Major concerns of the tribal representatives of the Timbisha Shoshone Tribe include the potential destruction of traditional plant and animal habitat, the amount of water that will be needed to sustain the solar facility and where it will come from, and the effect of solar energy development on Doctor Rock and the surrounding valley.

- Areas that contain evidence of volcanic activity have been identified as culturally important parts of the landscape. Volcanic events are thought to bring new *Puha* to the surface of the Earth. *Puha* follows the flow of magma, as it does with water, connecting places and elements. Doctor Rock is an example of volcanic *Puha*, although other places exist throughout the valley.

- Saline Valley has been identified as the creation point of the Shoshone people. Saline Valley is located approximately 52 mi (84 km) southwest of the proposed SEZ, west of Death and Eureka Valleys.

- Pigeon Springs, Shakespeare's Spring, Jackson Wash, and the Stonewall Mountain Hydrological System have been identified as important water sources. In particular, Pigeon Spring has been identified as a small Shoshone settlement and the location of an important community Round Dance in 1890. Tribal representatives described the Round Dance as a "Death Dance" meant to prepare the Shoshone for death and destruction by European and American soldiers. Early ethnographies describe the Round Dance as a world-balancing ceremony similar to the Ghost Dance.

- The following traditional plants have been identified in addition to those listed in Table 11.6.18.1-2 of the Draft Solar PEIS: buckbrush (*Purshia glandulosa*), bud sagebrush (*Picrothamnus desertorum*), creosote (*Larrea tridentate*), desert Indian paintbrush (*Castilleja angustifolia*), desert prince's plume/Indian spinach (*Stanleya pinnata*), Gold cholla/silver cholla (*Opuntia echinocarpa*), hairspine pricklypear (*Opuntia polyacantha*), horsebrush (*Tetradymia* sp.), Indian ricegrass (*Achnatherum hymenoides*), Indian tea (*Ephedra viridis*), locoweed (*Astragalus* sp.), orange lichen (*Caloplaca trachyphylla*), rattlesnake weed, rubber rabbitbrush (*Ericameria nauseosa*), shadescale (*Atriplex confertifolia*), and spiny menodora (*Mendora spinescens*).

- The following traditional animals have been identified in addition to those listed in Table 11.6.18.1-3 of the Draft Solar PEIS: American kestrel (*Falco sparverius*), killdeer (*Charadrius vocifeous*), red-tailed hawk (*Buteo jamaicensis*), and long-nosed leopard lizard (*Gambelia wislizenii*).

### 11.6.18.2 Impacts

The description of potential concerns provided in the Draft Solar PEIS remains valid. In the past, the Western Shoshone and Owens Valley Paiute have expressed concerns over project impacts on a variety of resources. While no comments specific to the proposed Gold Point SEZ have been received from Native American tribes to date, the Big Pine Paiute Tribe of the Owens Valley has commented on the scope of this PEIS. The tribe recommends that the BLM preserve undisturbed lands intact and that recently disturbed lands such as abandoned farm fields, rail yards, mines, and airfields be given primary consideration for solar energy development. Potential impacts on water supply are also a concern (Moose 2009). The construction of utility-scale solar energy facilities within the proposed SEZ would result in the destruction of some plants important to Native Americans and the habitat of some traditionally important animals.

In addition to the impacts discussed in the Draft Solar PEIS, the ethnographic study conducted for the proposed Gold Point SEZ identified the following impacts:

- Development within the proposed Gold Point SEZ will result in visual impacts on the valley when viewed from Magruder Mountain, Mount Jackson, Red Volcano, Doctor Rock, and Stonewall Mountain.

- Development within the proposed Gold Point SEZ may affect the spiritual connection of the Shoshone with water and magma through *Puha*. This possibility is especially true for developments near water sources such as Jackson Wash or near prominent volcanic features located within the SEZ.

- Development within the proposed Gold Point SEZ will likely adversely affect Jackson Wash, because several large segments of the wash are spread throughout the proposed SEZ.

- Development within the proposed SEZ will directly affect culturally important plant and animal resources, because it will likely require the grading of the project area, the removal of vegetation, and the destruction of burrows, nests, and migratory habitat.

### 11.6.18.3 SEZ-Specific Design Features and Design Feature Effectiveness

Tribal representatives believe that solar energy development within the Gold Point SEZ will have adverse impacts on water, culturally important geologic features, and traditionally important plant and animal resources (SWCA and University of Arizona 2011). Required programmatic design features that would reduce impacts on resources of concern to Native Americans are described in Section A.2.2 of Appendix A of this Final Solar PEIS. For example, impacts will be minimized through the avoidance of sacred sites, water sources, and tribally important plant and animal species. Programmatic design features require that the necessary surveys, evaluations, and consultations would occur. The Tribes would be notified regarding the results of archaeological surveys, and they would be contacted immediately upon the discovery of Native American human remains and associated cultural items.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features to address Native American concerns have been identified. The need for and nature of SEZ-specific design features would be determined during government-to-government consultation with affected tribes as part of the process of preparing parcels for competitive offer and subsequent project specific analysis. Potentially significant sites and landscapes in the vicinity of the SEZ associated with trails and trail features, Pigeon Spring, Indian Spring, Mount Jackson, Mount Jackson Ridge, Mount Dunfee, Magruder Mountain, Stonewall Mountain, Doctor Rock, Red Volcano, Lida Valley, and Tule Canyon, as well as other rock art sites, ceremonial areas and healing places, places of historic encounters, and plant and animal resources, should be considered and discussed during consultation.

## 11.6.19 Socioeconomics

### 11.6.19.1 Affected Environment

The boundaries of the proposed Gold Point SEZ have not changed. The socioeconomic ROI, the area in which site employees would live and spend their wages and salaries, and into which any in-migration would occur, includes the same counties and communities as described in the Draft Solar PEIS, meaning that no updates to the affected environment information given in the Draft Solar PEIS are required.

### 11.6.19.2 Impacts

Socioeconomic resources in the ROI around the SEZ could be affected by solar energy development through the creation of direct and indirect employment and income, the generation of direct sales and income taxes, SEZ acreage rental and capacity payments to the BLM, the in-migration of solar facility workers and their families, and impacts on local housing markets and local community service employment. Since the boundaries of the proposed Gold Point SEZ remain unchanged and the reduction of the developable area was small (less than 5%), the impacts estimated in the Draft Solar PEIS remain valid. During construction, between 124 and 1,641 jobs and between $10.5 and $139 million in income could be associated with solar development in the SEZ. During operations at full build-out, between 8 and 160 jobs and between $0.3 million and $7.2 million in income could be produced. In-migration of workers and their families would mean between 48 and 631 rental housing units would be needed during construction and between 3 and 63 owner-occupied units during operations.

#### 11.6.19.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce socioeconomic impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will reduce the potential for socioeconomic impacts during all project phases.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features to address socioeconomic impacts have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.6.20 Environmental Justice

#### 11.6.20.1 Affected Environment

The data presented in the Draft Solar PEIS for the proposed Gold Point SEZ have not changed substantially. There are no minority or low-income populations in the Nevada or California portions of the 50-mi (80-km) radius of the SEZ.

#### 11.6.20.2 Impacts

Potential impacts (e.g., from noise and dust during construction and operations, visual impacts, cultural impacts, and effects on property values) on low-income and minority populations could be incurred as a result of the construction and operation of solar facilities involving each of the four technologies. Impacts are likely to be small, and there are no minority populations defined by CEQ guidelines(CEQ 1997) or low-income populations (see Section 11.6.20.1 of the Draft Solar PEIS) within the 50-mi (80-km) radius around the boundary of the SEZ. This means that any adverse impacts of solar projects could not disproportionately affect minority and/or low-income populations.

#### 11.6.20.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce potential environmental justice impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will reduce the potential for such impacts.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features for environmental justice impacts have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.6.21 Transportation

### 11.6.21.1 Affected Environment

The reduction of about 4% in developable area of the proposed Gold Point SEZ does not change the information on affected environment for transportation provided in the Draft Solar PEIS.

### 11.6.21.2 Impacts

As stated in the Draft Solar PEIS, the primary transportation impacts are anticipated to be from commuting worker traffic. Single projects could involve up to 1,000 workers each day, with an additional 2,000 vehicle trips per day (maximum). The increase in the volume of traffic on U.S. 95 east of the proposed Gold Point SEZ, on State Route 266 past the northern border of the SEZ, and along State Route 744 along the eastern edge of the SEZ would represent increases in traffic of about 100%, 1,000%, and 10,000%, respectively. Also, higher traffic volumes would be experienced during shift changes. Thus, traffic on U.S. 95 could experience slowdowns during these periods in the vicinity of the junction with State Route 266, and local road improvements would be necessary on State Routes 266 and 774 in order not to overwhelm the local access roads near any site access points.

Solar development within the SEZ would affect public access along OHV routes that are designated open and available for public use. Although open routes crossing areas granted ROWs for solar facilities could be redesignated as closed (see Section 5.5.1 of the Draft Solar PEIS), a programmatic design feature has been included under Recreation (Section A.2.2.6.1 of Appendix A) that requires consideration of replacement of lost OHV route acreage and of access across and to public lands.

### 11.6.21.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce transportation impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. The programmatic design features, including local road improvements, multiple site access locations, staggered work schedules, and ride-sharing, would all provide some relief to traffic congestion on local roads leading to the SEZ. Depending on the location of solar facilities within the SEZ, more specific access locations and local road improvements could be implemented.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features to address transportation impacts have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.6.22 Cumulative Impacts

The analysis of potential impacts in the vicinity of the proposed Gold Point SEZ presented in the Draft Solar PEIS is still generally applicable for this Final Solar PEIS. The size of the developable area of the proposed SEZ has been reduced by about 4%. The following sections include an update to the information presented in the Draft Solar PEIS regarding cumulative effects for the proposed Gold Point SEZ.

### 11.6.22.1 Geographic Extent of the Cumulative Impact Analysis

The geographic extent of the cumulative impact analysis has not changed. The extent varies on the basis of the nature of the resource being evaluated and the distance at which the impact may occur (e.g., impacts on air quality may have a greater geographic extent than impacts on visual resources). The BLM, the NPS, the DOE, and the DoD administer most of the land around the SEZ. The BLM administers approximately 47% of the lands within a 50-mi (80-km) radius of the SEZ.

### 11.6.22.2 Overview of Ongoing and Reasonably Foreseeable Future Actions

The Draft Solar PEIS included six other proposed SEZs in Nevada. Two of these, the Delamar Valley SEZ and the East Mormon Mountain SEZ, have been removed from consideration.

There are no reasonably foreseeable future actions related to energy development and distribution near the proposed Gold Point SEZ.

The list of other major ongoing and foreseeable future actions within 50 mi (80 km) of the proposed Gold Point SEZ has been updated and is presented in Table 11.6.22.2-1. Projects listed in the table are shown in Figure 11.6.22.2-1.

### 11.6.22.3 General Trends

The information on general trends presented in the Draft Solar PEIS remains valid.

**TABLE 11.6.22.2-1 Ongoing and Reasonably Foreseeable Future Actions Related to Energy Development and Distribution and Other Major Actions near the Proposed Gold Point SEZ as Revised[a]**

| Description | Status | Resources Affected | Primary Impact Location |
|---|---|---|---|
| Beatty Water and Sanitation District Water Treatment Plant | **Operating[b]** | Drinking water | 43 mi[c] southeast of the SEZ |
| Chemetall Foote Lithium Carbonate Facility Expansion | **Under construction[d]** | Terrestrial habitats, wildlife, air quality | 25 mi northwest of the SEZ |
| Mineral Ridge Project | **Mining has resumed[e]** | Terrestrial habitats, water, air quality | 28 mi northwest of the SEZ |
| Caliente Rail Realignment | FEIS June 2008 | Terrestrial habitats, wildlife, cultural resources | 8 mi northwest of the SEZ |
| 120-kV Transmission Line | Operating | Disturbed areas, terrestrial habitats along transmission line ROW | Corridor passes from east to west–north of the SEZ |
| 120-kV Transmission Line | Operating | Disturbed areas, terrestrial habitats along transmission line ROW | Corridor passes from north to south–north of the SEZ |
| Producing Geothermal Lease (NVN 8421) | Operating | Terrestrial habitats, wildlife | 45 mi (72 km) northwest of the SEZ |
| Producing Geothermal Lease (NVN 8428) | Operating | Terrestrial habitats, wildlife | 45 mi (72 km) northwest of the SEZ |
| Producing Geothermal Lease (NVN 9647) | Operating | Terrestrial habitats, wildlife | 45 mi (72 km) northwest of the SEZ |
| Producing Geothermal Lease (NVN 31991) | Operating | Terrestrial habitats, wildlife | 45 mi (72 km) northwest of the SEZ |
| Producing Geothermal Lease (NVN 31993) | Operating | Terrestrial habitats, wildlife | 45 mi (72 km) northwest of the SEZ |

a Projects with status changed from that given in the Draft Solar PEIS are shown in bold text.

b See Stephens (2011) for details.

c To convert mi to km, multiply by 1.6093.

d See Chemetall (2010) for details.

e See Scorpio Gold Corporation (2011) for details.

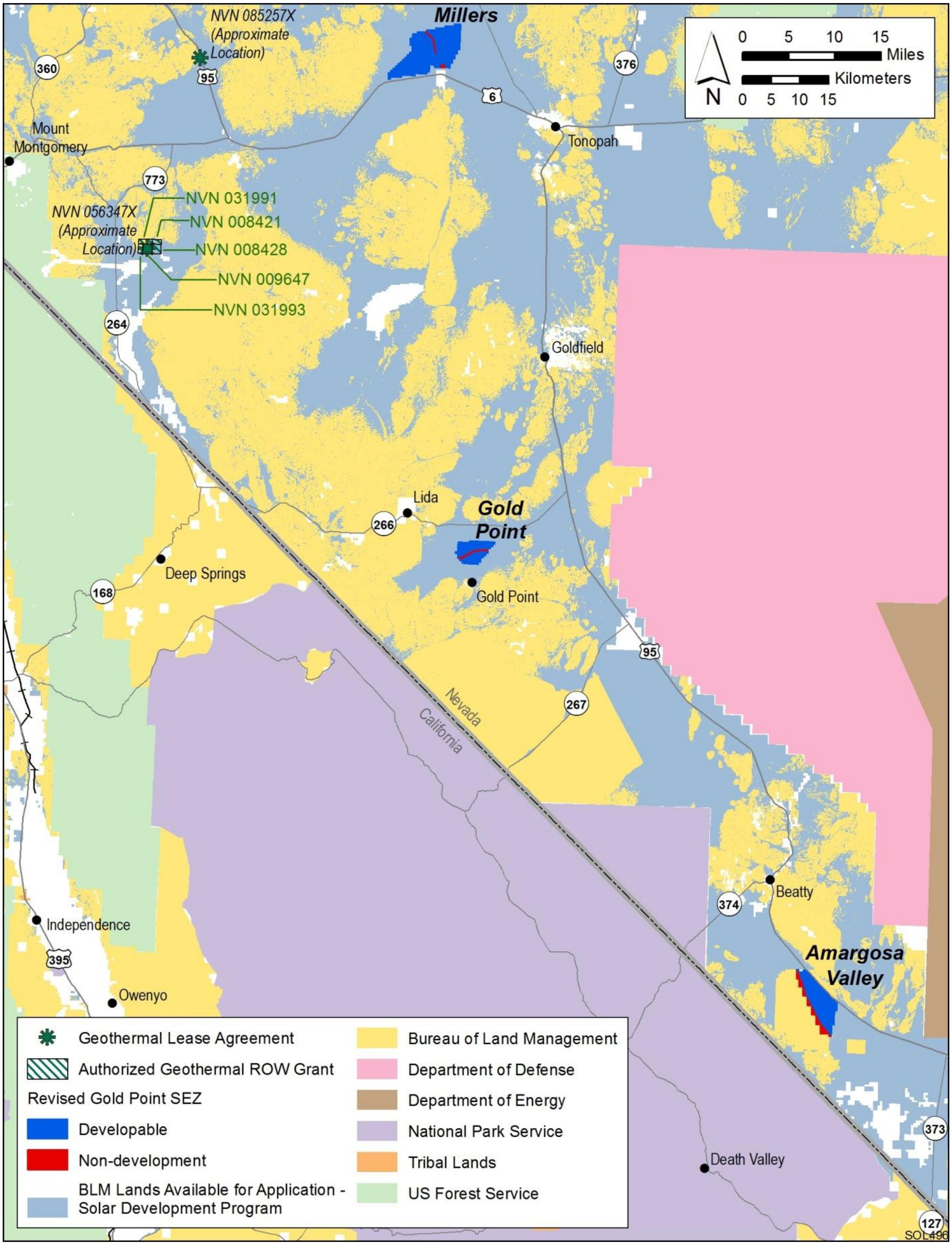


**FIGURE 11.6.22.2-1 Locations of Existing and Reasonably Foreseeable Energy Projects on Public Land within a 50-mi (80-km) Radius of the Proposed Gold Point SEZ as Revised**

### 11.6.22.4 Cumulative Impacts on Resources

Total disturbance in the proposed Gold Point SEZ over 20 years would be about 3,677 acres (14.9 $km^2$) (80% of the entire proposed SEZ). This development would contribute incrementally to the impacts from other past, present, and reasonably foreseeable future actions in the region as described in the Draft Solar PEIS. Primary impacts from development in the Gold Point SEZ may include impacts on water quantity and quality, air quality, ecological resources such as habitat and species, cultural and visual resources, and specially designated lands.

No additional major actions have been identified within 50 mi (80 km) of the SEZ. Therefore, the incremental cumulative impacts associated with development in the proposed Gold Point SEZ during construction, operation, and decommissioning are expected to be the same as those discussed in the Draft Solar PEIS.

## 11.6.23 Transmission Analysis

The methodology for this transmission analysis is described in Appendix G of this Final Solar PEIS. This section presents the results of the transmission analysis for the Gold Point SEZ, including the identification of potential load areas to be served by power generated at the SEZ and the results of the DLT analysis. Unlike Sections 11.6.2 through 11.6.22, this section is not an update of previous analysis for the Gold Point SEZ; this analysis was not presented in the Draft Solar PEIS. However, the methodology and a test case analysis were presented in the Supplement to the Draft Solar PEIS. Comments received on the material presented in the Supplement were to improve the methodology for the assessment presented in this Final Solar PEIS.

On the basis of its size, the assumption of a minimum of 5 acres (0.02 $km^2$) of land required per MW, and the assumption of a maximum of 80% of the land area developed, the Gold Point SEZ is estimated to have the potential to generate 735 MW of marketable solar power at full build-out.

### 11.6.23.1 Identification and Characterization of Load Areas

The primary candidates for Gold Point SEZ load areas are the major surrounding cities. Figure 11.6.23.1-1 shows the possible load areas for the Gold Point SEZ and the estimated portion of their market that could be served by solar generation. Possible load areas for the Gold Point SEZ include Phoenix, Arizona; Salt Lake City, Utah; Las Vegas and Reno, Nevada; and Los Angeles, San Jose, San Francisco, Oakland, and Sacramento, California.

The two load area groupings examined for the Gold Point SEZ are as follows:

1. Las Vegas, Nevada; and

2. Reno, Nevada; and Sacramento, California.

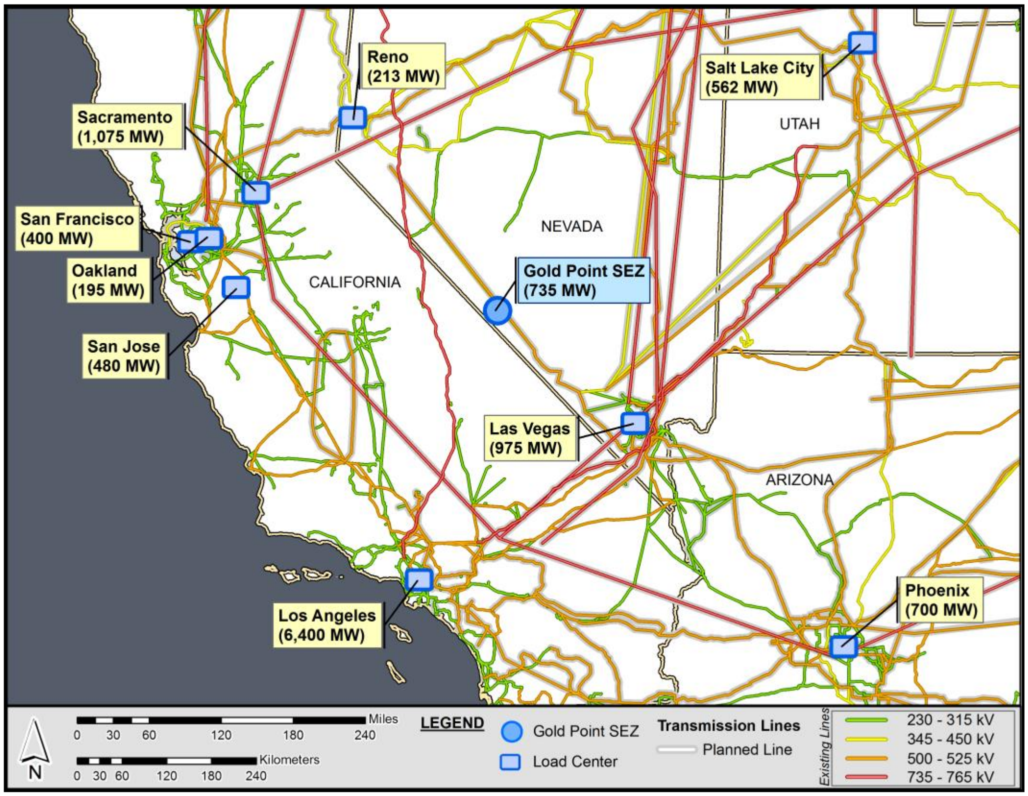


**FIGURE 11.6.23.1-1 Location of the Proposed Gold Point SEZ and Possible Load Areas (Source for background map: Platts 2011)**

Figure 11.6.23.1-2 shows the most economically viable transmission scheme for the Gold Point SEZ (transmission scheme 1), and Figure 11.6.23.1-3 shows an alternative transmission scheme (transmission scheme 2) that represents a logical choice should transmission scheme 1 be infeasible. As described in Appendix G, the alternative shown in transmission scheme 2 represents the optimum choice if one or more of the primary linkages in transmission scheme 1 are excluded from consideration. The groups provide for linking loads along alternative routes so that the SEZ's output of 735 MW could be fully allocated.

Table 11.6.23.1-1 summarizes and groups the load areas according to their associated transmission scheme and provides details on how the megawatt load for each area was estimated.

### 11.6.23.2 Findings for the DLT Analysis

The DLT analysis approach assumes that the Gold Point SEZ will require all new construction for transmission lines (i.e., dedicated lines) and substations. The new transmission lines(s) would directly convey the 735-MW output of the Gold Point SEZ to the prospective load areas for each possible transmission scheme. The approach also assumes that all existing transmission lines in the WECC region are saturated and have little or no available capacity to accommodate the SEZ's output throughout the entire 10-year study horizon.

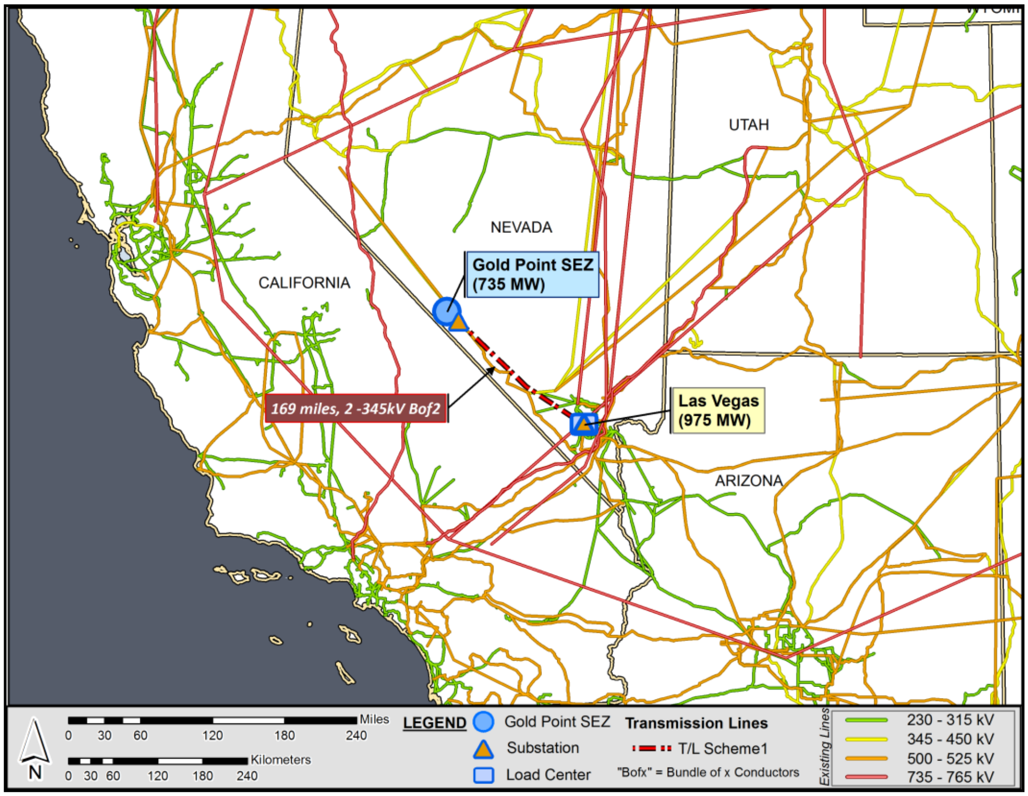


**FIGURE 11.6.23.1-2 Transmission Scheme 1 for the Proposed Gold Point SEZ (Source for background map: Platts 2011)**

Figures 11.6.23.1-2 and 11.6.23.1-3 display the pathways that new dedicated lines might follow to distribute solar power generated at the Gold Point SEZ via the two identified transmission schemes described in Table 11.6.23.1-1. These pathways parallel existing 500-kV, 345-kV, and/or lower voltage lines. The intent of following existing lines is to avoid pathways that may be infeasible due to topographical limitations or other concerns.

For transmission scheme 1, a new line would be constructed to connect with Las Vegas (975 MW), so that the 735-MW output of the Gold Point SEZ could be fully utilized (Figure 11.6.23.1-2). This particular scheme has one segment that extends to the southeast from the SEZ to Las Vegas (975 MW) over a distance of about 169 mi (272 km). This segment would require a double-circuit 345-kV (2-345-kV) bundle of two conductors (Bof2) transmission line design based on engineering and operational considerations. In general, the transmission configuration options were determined by using the line “loadability” curve provided in American Electric Power’s *Transmission Facts* (AEP 2010). Appendix G documents the line options used for this analysis and describes how the load area groupings were determined.

For transmission scheme 2, serving load centers to the northwest, Figure 11.6.23.1-3 shows that new lines would be constructed to connect with Reno (213 MW) and Sacramento (1,075 MW), so that the 735-MW output of the Gold Point SEZ could be fully utilized. This scheme has three segments. The first segment extends to the northwest from the SEZ to Reno

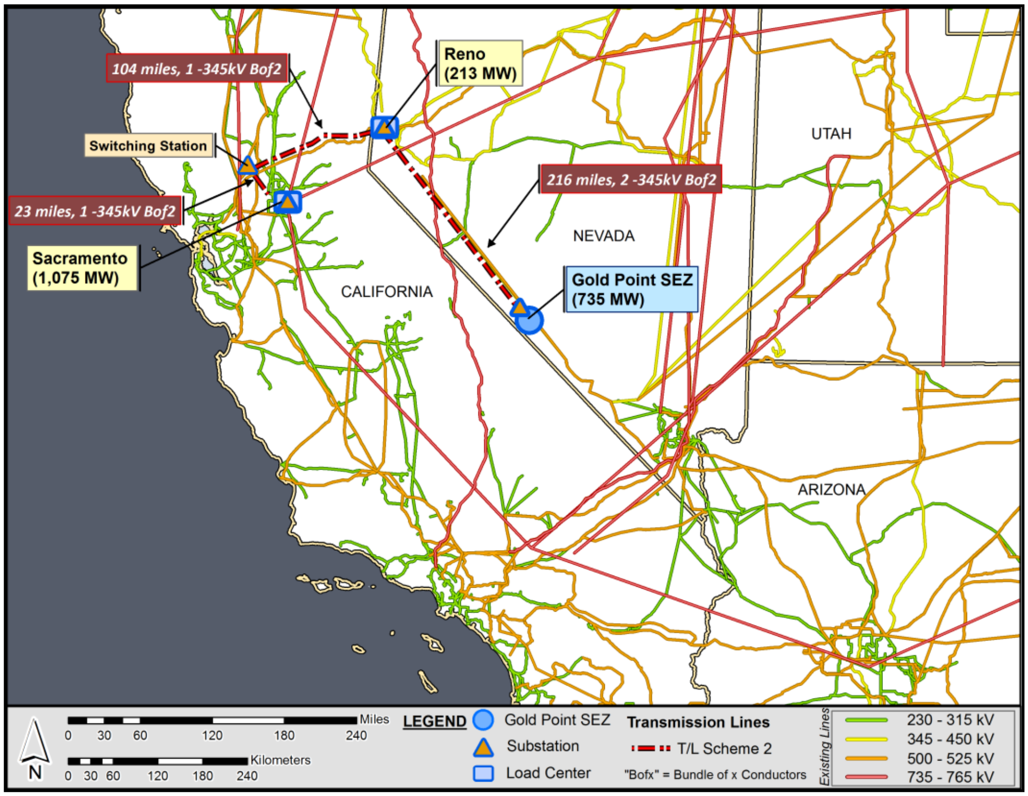


**FIGURE 11.6.23.1-3 Transmission Scheme 2 for the Proposed Gold Point SEZ (Source for background map: Platts 2011)**

**TABLE 11.6.23.1-1 Candidate Load Area Characteristics for the Proposed Gold Point SEZ**

| Transmission Scheme | City/Load Area Name[a] | Position Relative to SEZ | 2010 Population[b] | Estimated Total Peak Load (MW) | Estimated Peak Solar Market (MW) |
|---|---|---|---|---|---|
| 1 | Las Vegas, Nevada | Southeast | 1,950,000 | 4,875 | 975 |
| 2 | Reno, Nevada | Northwest | 425,000 | 1,063 | 213 |
| | Sacramento, California | Northwest | 2,150,000 | 5,375 | 1,075 |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] City and metropolitan area population data are from 2010 Census data (U.S. Bureau of the Census 2010).

(213 MW) over a distance of about 216 mi (348 km). This segment would require a double-circuit 345-kV (2-345 kV) bundle of two (Bof2) transmission line design. The second segment runs about 104 mi (167 km) east from Reno to a switching station located just north of Sacramento area, while the third segment extends from the switching station south about 23 mi (37 km) to Sacramento (1,075 MW). The second and third segments require a single-circuit 345-kV bundle of two (Bof2) transmission line design.

Table 11.6.23.2-1 summarizes the distances to the various load areas over which new transmission lines would need to be constructed, as well as the assumed number of substations that would be required. One substation is assumed to be installed at each load area and an additional one at the SEZ. In general, the total number of substations per scheme is simply equal to the number of load areas associated with the scheme plus one. Substations at the load areas would consist of one or more step-down transformers, while the originating substation at the SEZ would consist of several step-up transformers. The originating substation would have a rating of at least 735 MW (to match the plant's output), while the combined load substations would have a similar total rating of 735 MW. For schemes that require branching of the lines, a switching substation is assumed to be constructed at the appropriate junction. In general, switching stations carry no local load but are assumed to be equipped with switching gears (e.g., circuit breakers and connecting switches) to reroute power as well as, in some cases, additional equipment to regulate voltage.

Table 11.6.23.2-2 provides an estimate of the total land area disturbed for construction of new transmission facilities under each of the schemes evaluated. The most favorable transmission scheme with respect to minimizing costs and the area disturbed would be scheme 1, which would serve Las Vegas. This scheme is estimated to potentially disturb about 3,603 acres (14.6 km$^2$) of land. The less favorable transmission scheme with respect to minimizing costs and the area disturbed would be scheme 2, which serves Reno and Sacramento loads. For this

**TABLE 11.6.23.2-1 Potential Transmission Schemes, Estimated Solar Markets, and Distances to Load Areas for the Proposed Gold Point SEZ**

| Transmission Scheme | City/Load Area Name[a] | Estimated Peak Solar Market (MW)[b] | Total Solar Market (MW) | Sequential Distance (mi)[c] | Total Distance (mi)[c] | Line Voltage (kV) | No. of Substations |
|---|---|---|---|---|---|---|---|
| 1 | Las Vegas, Nevada | 975 | 975 | 169 | 169 | 345 | 2 |
| 2 | Reno, Nevada | 213 | 1,288 | 216 | 343 | 345 | 4 |
| | Sacramento, California | 1,075 | | 127 | | | |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] From Table 11.6.23.1-1.

[c] To convert mi to km, multiply by 1.6093.

**TABLE 11.6.23.2-2 Comparison of the Various Transmission Line Configurations with Respect to Land Use Requirements for the Proposed Gold Point SEZ**

| | | | | Land Use (acres)[c] | | |
|---|---|---|---|---|---|---|
| Transmission Scheme | City/Load Area Name[a] | Total Distance (mi)[b] | No. of Substations | Transmission Line | Substation | Total |
| 1 | Las Vegas, Nevada | 169 | 2 | 3,584.8 | 17.7 | 3,602.5 |
| 2 | Reno, Nevada<br>Sacramento, California | 343 | 4 | 7,275.8 | 17.7 | 7,293.5 |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] To convert mi to km, multiply by 1.6093.

[c] To convert acres to km$^2$, multiply by 0.004047.

scheme, the construction of new transmission lines and substations is estimated to disturb a land area on the order of 7,294 acres (29.5 km$^2$).

Table 11.6.23.2-3 shows the estimated NPV of both transmission schemes and takes into account the cost of constructing the lines, the substations, and the projected revenue stream over the 10-year horizon. A positive NPV indicates that revenues more than offset investments. This calculation does not include the cost of producing electricity.

The most economically attractive configuration (transmission scheme 1) has the highest positive NPV and serves Las Vegas. The secondary case (transmission scheme 2), which excludes one or more of the primary pathways used in scheme 1, is less economically attractive and serves the Reno and Sacramento markets. For the assumed utilization factor of 20%, both

**TABLE 11.6.23.2-3 Comparison of Potential Transmission Lines with Respect to NPV (Base Case) for the Proposed Gold Point SEZ**

| Transmission Scheme | City/Load Area Name[a] | Present Value Transmission Line Cost ($ million) | Present Value Substation Cost ($ million) | Annual Sales Revenue ($ million) | Present Worth of Revenue Stream ($ million) | NPV ($ million) |
|---|---|---|---|---|---|---|
| 1 | Las Vegas, Nevada | 422.5 | 48.5 | 128.8 | 994.3 | 523.3 |
| 2 | Reno, Nevada<br>Sacramento, California | 819.4 | 48.5 | 128.8 | 994.3 | 126.4 |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

options exhibit positive NPVs, implying varying degrees of economic viability under the current assumptions.

Table 11.6.23.2-4 shows the effect of varying the value of the utilization factor on the NPV of the transmission schemes. It also shows that as the utilization factor is increased, the economic viability of the lines increases. Utilization factors can be raised by allowing the new dedicated lines to market other power generation outputs in the region in addition to that of its associated SEZ.

The findings of the DLT analysis for the proposed Gold Point SEZ are as follows:

- Transmission scheme 1, which identifies Las Vegas as the primary market, represents the most favorable option based on NPV and land use requirements. This configuration would result in new land disturbance of about 3,603 acres (14.6 $km^2$).

- Transmission scheme 2, which represents an alternative configuration if Las Vegas is excluded, serves Reno and Sacramento. This configuration would result in new land disturbance of about 7,294 acres (29.5 $km^2$).

- Other load area configurations are possible but would be less favorable than scheme 1 in terms of NPV and, in most cases, also in terms of land use requirements. If new electricity generation at the proposed Gold Point SEZ is not sent to either of the two markets identified above, the potential upper-bound impacts in terms of cost would be greater.

- The analysis of transmission requirements for the proposed Gold Point SEZ indicates no reduction of impacts from increasing the solar-eligible load assumption for transmission scheme 1, which brings power to Las Vegas. Increasing the solar-eligible percentage would have no effect, because an adequate load area was identified under the 20% assumption that would

**TABLE 11.6.23.2-4 Effect of Varying the Utilization Factor on the NPV of the Transmission Schemes for the Proposed Gold Point SEZ**

| | | NPV ($ million) at Different Utilization Factors | | | | | |
|---|---|---|---|---|---|---|---|
| Transmission Scheme | City/Load Area Name[a] | 20% | 30% | 40% | 50% | 60% | 70% |
| 1 | Las Vegas, Nevada | 523 | 1,021 | 1,518 | 2,015 | 2,512 | 3,009 |
| 2 | Reno, Nevada<br>Sacramento, California | 126 | 624 | 1,121 | 1,618 | 2,115 | 2,612 |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

accommodate all of the SEZ’s capacity. Thus, line distances and voltages would not be affected by increasing the solar-eligible load assumption, and similarly the associated costs and land disturbance would not be affected. However, for transmission scheme 2, which serves Reno and Sacramento, increasing the solar-eligible load assumption could result in lower cost and land disturbance estimates, because it is possible that fewer load areas would be needed to accommodate the SEZ’s capacity.

### 11.6.24 Impacts of the Withdrawal

The BLM is proposing to withdraw 4,810 acres (19 $km^2$) of public land comprising the proposed Gold Point SEZ from settlement, sale, location, or entry under the general land laws, including the mining laws, for a period of 20 years (see Section 2.2.2.2.4 of the Final Solar PEIS). The public lands would be withdrawn, subject to valid existing rights, from settlement, sale, location, or entry under the general land laws, including the mining laws. This means that the lands could not be appropriated, sold, or exchanged during the term of the withdrawal, and new mining claims could not be filed on the withdrawn lands. Mining claims filed prior to the segregation or withdrawal of the identified lands would take precedence over future solar energy development. The withdrawn lands would remain open to the mineral leasing, geothermal leasing, and mineral material laws, and the BLM could elect to lease the oil, gas, coal, or geothermal steam resources, or to sell common-variety mineral materials, such as sand and gravel, contained in the withdrawn lands. In addition, the BLM would retain the discretion to authorize linear and renewable energy ROWs on the withdrawn lands.

The purpose of the proposed land withdrawal is to minimize the potential for conflicts between mineral development and solar energy development for the proposed 20-year withdrawal period. Under the land withdrawal, there would be no mining-related surface development, such as the establishment of open pit mining, construction of roads for hauling materials, extraction of ores from tunnels or adits, or construction of facilities to process the material mined, that could preclude use of the SEZ for solar energy development. For the Gold Point SEZ, impacts of the proposed withdrawal on mineral resources and related economic activity and employment are expected to be negligible to minor (BLM 2012). Although the western half of the SEZ historically contained load and placer claims, those claims are all closed, and there is no evidence of previous production from the site. And because the lands are currently segregated, no additional mining claims can be filed.

Although the mineral potential of the lands within the Gold Point SEZ is low, the proposed withdrawal of lands within the SEZ would preclude many types of mining activity over a 20-year period, resulting in the avoidance of potential mining related adverse impacts. Impacts commonly related to mining development include increased soil erosion and sedimentation, water use, generation of contaminated water in need of treatment, creation of lagoons and ponds (hazardous to wildlife), toxic runoff, air pollution, establishment of noxious weeds and invasive species, habitat destruction or fragmentation, disturbance of wildlife, blockage of migration corridors, increased visual contrast, noise, destruction of cultural artifacts and fossils and/or their context, disruption of landscapes and sacred places of interest to tribes, increased traffic and related emissions, and conflicts with other land uses (e.g., recreational).

### 11.6.25 References

*Note to Reader:* This list of references identifies Web pages and associated URLs where reference data were obtained for the analyses presented in this Final Solar PEIS. It is likely that at the time of publication of this Final Solar PEIS, some of these Web pages may no longer be available or the URL addresses may have changed. The original information has been retained and is available through the Public Information Docket for this Final Solar PEIS.


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## 11.6.26 Errata for the Proposed Gold Point SEZ

This section presents corrections to material presented in the Draft Solar PEIS and the Supplement to the Draft. The need for these corrections was identified in several ways: through comments received on the Draft Solar PEIS and the Supplement to the Draft (and verified by the authors), through new information obtained by the authors subsequent to publication of the Draft Solar PEIS and the Supplement to the Draft, or through additional review of the original material by the authors. Table 11.6.26-1 provides corrections to information presented in the Draft Solar PEIS and the Supplement to the Draft.

**TABLE 11.6.26-1 Errata for the Proposed Gold Point SEZ (Section 11.6 of the Draft Solar PEIS and Section C.4.4 of the Supplement to the Draft Solar PEIS)**

| Section No. | Page No. | Line No. | Table or Figure No. | Correction |
|---|---|---|---|---|
| 11.6.1.3 | 11.6-5 | NA | Table 11.6.1.3-1 | Text under Specially Designated Areas stated “light from solar facilities could adversely affect night sky viewing in some specially designated areas.” Further analysis and consideration of required programmatic design features (see Section A.2.2.13.1, Night Sky Protection) indicates that adverse impacts on night sky viewing would not be anticipated. |
| 11.6.3.2.1 | 11.6-24 | 36-41 | | Text stated that light from solar development in the SEZ could adversely affect night sky viewing from Death Valley National Park and adjoining specially designated areas. Further review and consideration of required programmatic design features (see Section A.2.2.13.1, Night Sky Protection) indicates that adverse impacts on night sky viewing would not be anticipated. |
| 11.6.11.2 | | | | All uses of the term “neotropical migrants” in the text and tables of this section should be replaced with the term “passerines.” |

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## 11.7 MILLERS

### 11.7.1 Background and Summary of Impacts

#### 11.7.1.1 General Information

The proposed Millers SEZ is located in Esmeralda County in southern Nevada, 44 mi (71 km) east of the California border. In 2008, the county population was 664, while adjacent Nye County to the west had a population of 44,175. The nearest town is Tonopah, Nevada, about 15 mi (24 km) west in Nye County, with a population of approximately 1,500. The NTTR is 30 mi (48 km) northeast of the SEZ. As of October 28, 2011, there were no pending solar applications within or adjacent to the SEZ.

The nearest major road access to the proposed SEZ is via U.S. 95/U.S. 6, which runs east–west along its southern border. The nearest railroad stop is 90 mi (145 km) away in Thorne, which is the end of a spur from the main line of the UP Railroad. Tonopah Airport, a small county airport 23 mi (37 km) to the east of the SEZ, and three public airports managed by the BLM serve the area, although none has scheduled commercial passenger service or regular freight service.

As published in the Draft Solar PEIS (BLM and DOE 2010), the proposed Millers SEZ had a total area of 16,787 acres (66.9 km$^2$). In the Supplement to the Draft Solar PEIS (BLM and DOE 2011), no boundary revisions were identified for the proposed SEZ (see Figure 11.7.1.1-1). However, areas specified for non-development were mapped, where data were available. For the proposed Millers SEZ, Ione Wash and a small wetland area in the southern portion of the SEZ, totaling 253 acres (1.0 km$^2$), were identified as non-development areas (see Figure 11.7.1.1-2). The remaining developable area within the SEZ is 16,534 acres (66.9 km$^2$).

The analyses in the following sections update the affected environment and potential environmental, cultural, and socioeconomic impacts associated with utility-scale solar energy development in the Millers SEZ as described in the Draft Solar PEIS.

#### 11.7.1.2 Development Assumptions for the Impact Analysis

Maximum solar development of the Millers SEZ is assumed to be 80% of the SEZ area over a period of 20 years, a maximum of 13,227 acres (54 km$^2$) (Table 11.7.1.2-1). Full development of the Millers SEZ would allow development of facilities with an estimated total of between 1,470 MW (power tower, dish engine, or PV technologies, 9 acres/MW [0.04 km$^2$/MW]) and 2,645 MW (solar trough technologies, 5 acres/MW [0.02 km$^2$/MW]) of electrical power capacity.

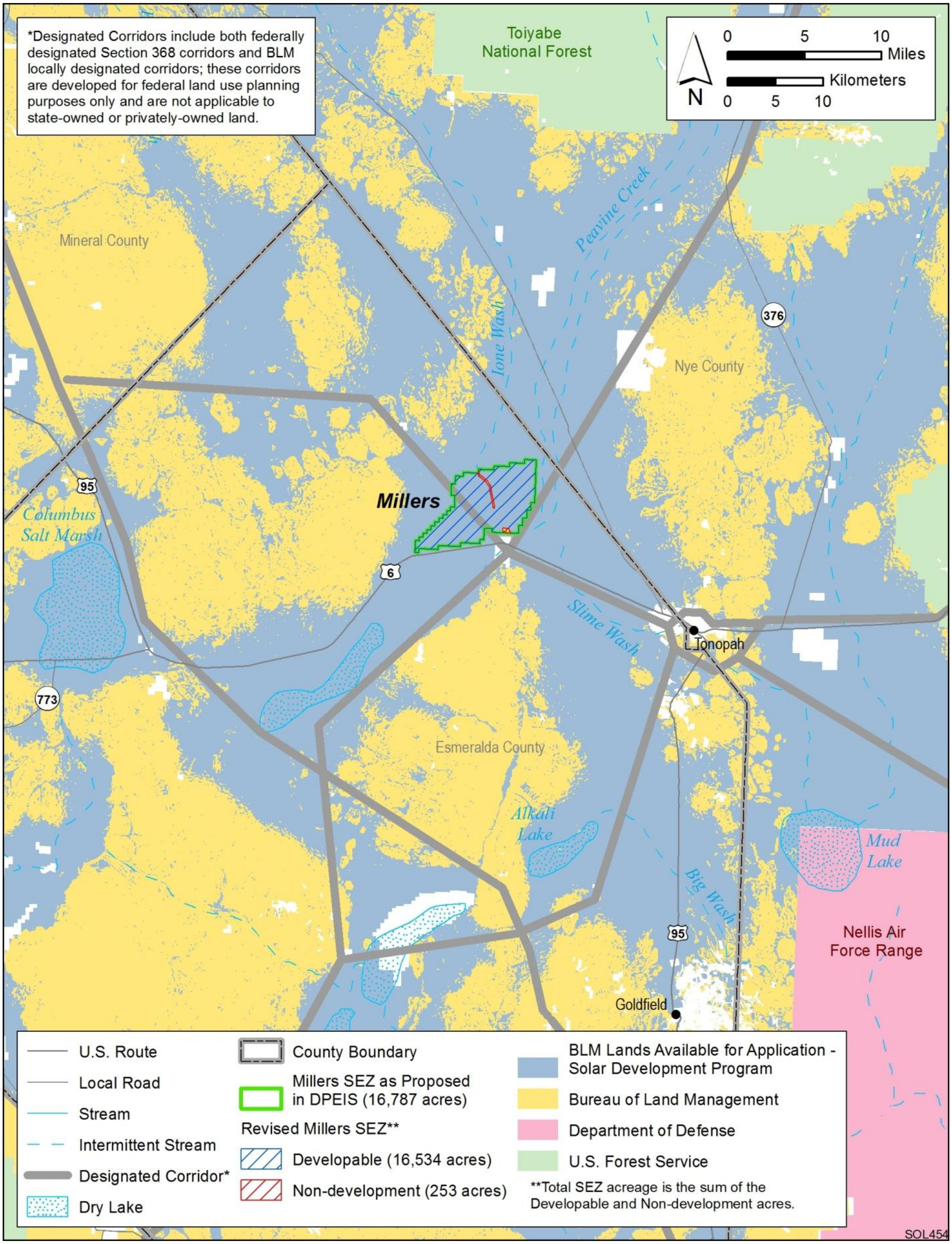


**FIGURE 11.7.1.1-1 Proposed Millers SEZ as Revised**

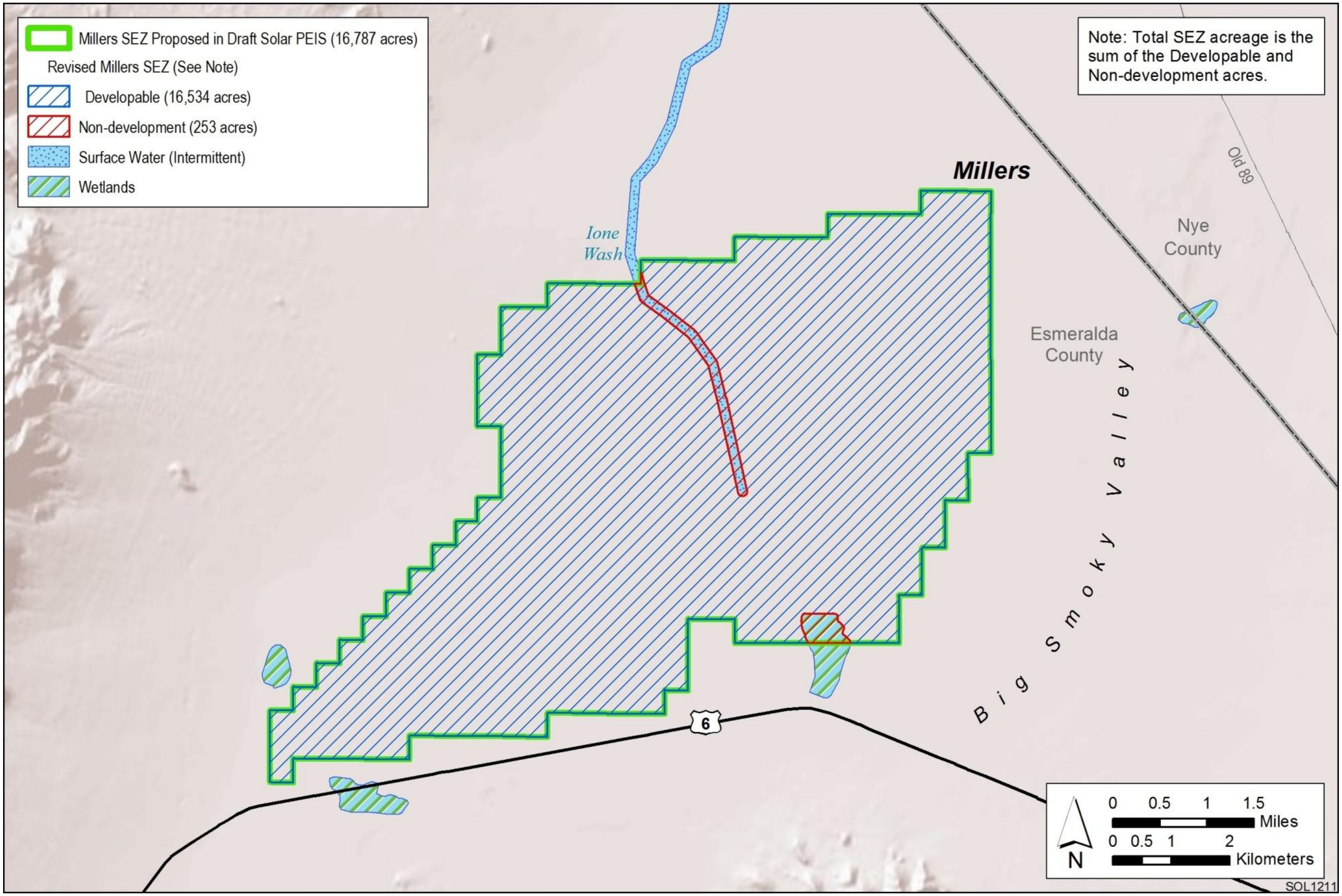


**FIGURE 11.7.1.1-2 Developable and Non-development Areas for the Proposed Millers SEZ as Revised**

**TABLE 11.7.1.2-1 Assumed Development Acreages, Solar MW Output, and Nearest Major Access Road and Transmission Line for the Proposed Millers SEZ as Revised**

| Total Developable Acreage and Assumed Developed Acreage (80% of Total) | Assumed Maximum SEZ Output for Various Solar Technologies | Distance to Nearest State, U.S., or Interstate Highway | Distance and Capacity of Nearest Existing Transmission Line | Area of Assumed Road ROW | Distance to Nearest Designated Corridor[f] |
|---|---|---|---|---|---|
| 16,534 acres[a] and 13,227 acres | 1,470 MW[b] 2,645 MW[c] | U.S. 95/U.S. 6 adjacent | 0 mi[d] 120 kV | NA[e] | Adjacent |

[a] To convert acres to $km^2$, multiply by 0.004047.

[b] Maximum power output if the SEZ were fully developed using power tower, dish engine, or PV technologies, assuming 9 acres/MW (0.04 $km^2$/MW) of land required.

[c] Maximum power output if the SEZ were fully developed using solar trough technologies, assuming 5 acres/MW (0.02 $km^2$/MW) of land required.

[d] To convert mi to km, multiply by 1.6093.

[e] NA = no access road construction is assumed necessary for the SEZ.

[f] BLM-designated corridors are developed for federal land use planning purposes only and are not applicable to state-owned or privately owned land.

Availability of transmission from SEZs to load centers will be an important consideration for future development in SEZs. For the proposed Millers SEZ, the nearest existing transmission line as identified in the Draft Solar PEIS is a 120-kV line that runs through the SEZ. It is possible that this existing line could be used to provide access from the SEZ to the transmission grid, but the 120-kV capacity of the line would not be adequate for the possible 1,470 to 2,645 MW of new capacity. Therefore, at full build-out capacity, new transmission and/or upgrades of existing transmission lines would be required to bring electricity from the proposed Millers SEZ to load centers. An assessment of the most likely load center destinations for power generated at the Millers SEZ and a general assessment of the impacts of constructing and operating new transmission facilities to those load centers are provided in Section 11.7.23. In addition, the generic impacts of transmission and associated infrastructure construction and of line upgrades for various resources are discussed in Chapter 5 of this Final Solar PEIS. Project-specific analyses would be required to identify the specific impacts of new transmission construction and line upgrades for any projects proposed within the SEZ.

For the proposed Millers SEZ, U.S. 95/U.S. 6 runs from east to west along the southern border of the SEZ. Existing road access to the proposed Millers SEZ should be adequate to support construction and operation of solar facilities. No additional road construction outside of the SEZ was assumed to be required to support solar development.

The Millers SEZ partially overlaps a locally designated transmission corridor. For this impact assessment, it is assumed that up to 80% of the proposed SEZ could be developed. This does not take into account the potential limitations to solar development that may result from siting constraints associated with the corridor. The development of solar facilities and the existing corridor will be dealt with by the BLM on a case-by-case basis; see Section 11.7.2.2 on impacts on lands and realty for further discussion.

#### 11.7.1.3 Programmatic and SEZ-Specific Design Features

The proposed programmatic design features for each resource area to be required under the BLM Solar Energy Program are presented in Section A.2.2 of Appendix A of this Final Solar PEIS. These programmatic design features are intended to avoid, minimize, and/or mitigate adverse impacts from solar energy development and will be required for development on all BLM-administered lands including SEZ and non-SEZ lands.

The discussions below addressing potential impacts of solar energy development on specific resource areas (Sections 11.7.2 through 11.7.22) also provide an assessment of the effectiveness of the programmatic design features in mitigating adverse impacts from solar development within the SEZ. SEZ-specific design features to address impacts specific to the proposed Millers SEZ may be required in addition to the programmatic design features. The proposed SEZ-specific design features for the Millers SEZ have been updated on the basis of revisions to the SEZ since the Draft Solar PEIS (such as the identification of non-development areas) and on the basis of comments received on the Draft Solar PEIS and Supplement to the Draft. All applicable SEZ-specific design features identified to date (including those from the Draft Solar PEIS that are still applicable) are presented in Sections 11.7.2 through 11.7.22.

### 11.7.2 Lands and Realty

#### 11.7.2.1 Affected Environment

The exterior boundary of the proposed SEZ remains the same as that in the Draft Solar PEIS. Within the boundary of the proposed Millers SEZ, about 253 acres (1.0 km$^2$) along Ione Wash and a small wetland area have been designated as non-development areas, leaving a total developable area within the SEZ of 16,534 acres (66.9 km$^2$). Since the Draft Solar PEIS was published, the BLM has authorized a solar energy development ROW for a facility utilizing power tower technology about 3.2 mi (5 km) east of the proposed SEZ.

#### 11.7.2.2 Impacts

The description of impacts in the Draft Solar PEIS remains the same with the exception of the classification of land along Ione Wash and the small wetland as non-development areas. In addition, with the approval of the solar facility east of the SEZ, solar development within the SEZ would no longer be unique in the immediate area and would present less of a discordant appearance. The major impact of the proposed SEZ on lands and realty activities remains: it would establish a large industrial area that would exclude many existing and potential uses of the land.

The proposed Millers SEZ partially overlaps a locally designated transmission corridor. This existing corridor will be used primarily for the siting of transmission lines and other infrastructure such as pipelines. The existing corridor will be the preferred location for any transmission development that is required to support solar development and future transmission grid improvements related to the build-out of the Millers SEZ. Any use of the corridor lands within the Millers SEZ for solar energy facilities, such as solar panels or heliostats, must be compatible with the future use of the existing corridor. The BLM will assess solar projects in the vicinity of the existing corridor on a case-by-case basis. The BLM will review and approve individual project plans of development to ensure compatible development that maintains the use of the corridor.

#### 11.7.2.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on lands and realty are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some mitigation for the identified impacts but will not mitigate all adverse impacts. For example, impacts related to the exclusion of many existing and potential uses of the public land, the visual impact of an industrial-type solar facility within an otherwise rural area, and induced land use changes, if any, on nearby or adjacent state and private lands may not be fully mitigated

No SEZ-specific design features to address impacts on lands and realty in the proposed Millers SEZ have been identified through this Final Solar PEIS. Some SEZ-specific design features may be established for parcels within the Millers SEZ through the process of preparing parcels for competitive offer and subsequent project-specific analysis..

### 11.7.3 Specially Designated Areas and Lands with Wilderness Characteristics

#### 11.7.3.1 Affected Environment

There are no specially designated areas or lands with wilderness characteristics within 25 mi (40 km) of the SEZ. The description in the Draft Solar PEIS is still valid.

#### 11.7.3.2 Impacts

Because there are no affected resources within 25 mi (40 km) of the SEZ, no impacts have been identified.

### 11.7.3.3 SEZ-Specific Design Features and Design Feature Effectiveness

Since there are no specially designated areas or lands with wilderness characteristics within 25 mi (40 km) of the SEZ, no SEZ-specific design features to address impacts on such areas are required for the proposed Millers SEZ.

## 11.7.4 Rangeland Resources

### 11.7.4.1 Livestock Grazing

#### *11.7.4.1.1 Affected Environment*

The proposed SEZ contains a small percentage of one livestock grazing allotment, and the description in the Draft Solar PEIS remains valid.

#### *11.7.4.1.2 Impacts*

Grazing would be excluded from areas of the SEZ developed for solar energy production. The SEZ includes about 4% of the Magruder grazing allotment. If all of the SEZ were developed, it is anticipated that there would be only a minimal impact on the overall grazing operation. It is likely that because of the large size of the allotment, any losses associated with development of the SEZ would be absorbed elsewhere within the allotment.

#### *11.7.4.1.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on livestock grazing are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some mitigation for any identified impacts.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features to address impacts on livestock grazing have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.7.4.2 Wild Horses and Burros

#### *11.7.4.2.1 Affected Environment*

As presented in Section 11.7.4.2.1 of the Draft Solar PEIS, no wild horse or burro HMAs occur within the proposed Millers SEZ or in close proximity to it.

##### *11.7.4.2.2 Impacts*

As presented in the Draft Solar PEIS, solar energy development within the proposed Millers SEZ would not directly affect wild horses and burros.

##### *11.7.4.2.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Because solar energy development within the proposed Millers SEZ would not affect wild horses and burros, no SEZ-specific design features to address wild horses and burros have been identified in this Final Solar PEIS.

### 11.7.5 Recreation

#### 11.7.5.1 Affected Environment

The description of the area within and around the proposed Millers SEZ in the Draft Solar PEIS remains valid. The overall appearance of the site is uniform and somewhat monotonous, and it is believed that the area receives no significant recreational use.

#### 11.7.5.2 Impacts

Recreational use would be eliminated from portions of the SEZ developed for solar energy production. The level of recreational use in the area is thought to be low, and the impact on recreational use is anticipated to be minimal. The exception to this would be the presence within the SEZ of a portion of the route for the Las Vegas to Reno OHV race; this portion would be closed. It is anticipated that the race course would be rerouted around the SEZ to avoid the economic and recreational loss that would occur if this was not done.

In addition, lands that are outside of the proposed SEZ may be acquired or managed for mitigation of impacts on other resources (e.g., sensitive species). Managing these lands for mitigation could further exclude or restrict recreational use, potentially leading to additional losses in recreational opportunities in the region. The impact of acquisition and management of mitigation lands would be considered as a part of the environmental analysis of specific solar energy projects.

#### 11.7.5.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on recreational resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide adequate mitigation for most of the identified impacts with the exception of the potential impact on desert racing.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, the following SEZ-specific design feature for the Millers SEZ has been identified:

- Alternative routes for the Las Vegas–Reno race should be considered consistent with local land use plan requirements.

The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project specific analysis.

## 11.7.6 Military and Civilian Aviation

### 11.7.6.1 Affected Environment

The description in the Draft Solar PEIS remains valid. Approximately the eastern two-thirds of the proposed Millers SEZ is covered by MTRs, with 50- and 100-ft (15- and 30-m) AGL operating limits. The area is located about 26 mi (42 km) northwest of the boundary of the NTTR. The closest civilian aviation facility is the Tonopah Municipal Airport, which is located about 20 mi (32 km) southeast of the SEZ.

### 11.7.6.2 Impacts

Impacts described in the Draft Solar PEIS remain valid and have been updated with additional input from the DoD. Impacts include the following:

- Solar development could encroach into MTR airspace that crosses the SEZ; structures higher than 50 ft (15 m) AGL may present unacceptable electromagnetic compatibility concerns for the NTTR test mission.

- Light from solar facilities could affect DoD nighttime operations.

Through comments on the Draft Solar PEIS and the Supplement to the Draft, the DoD expressed concern for solar energy facilities that might affect military test and training operations. The DoD requested that the technology at the proposed Millers SEZ be restricted to low-profile, low-glare PV technologies under 50 ft (15 m) AGL, similar to the PV I Array at Nellis Air Force Base.

### 11.7.6.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on military and civilian aviation are described in Section A.2.2 of Appendix A of this Final Solar PEIS. The programmatic design features require early coordination with the DoD to identify and avoid, minimize, and/or mitigate, if possible, potential impacts on the use of military airspace.

No SEZ-specific design features to address impacts on military and civilian aviation for the Millers SEZ have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.7.7 Geologic Setting and Soil Resources

### 11.7.7.1 Affected Environment

#### *11.7.7.1.1 Geologic Setting*

Data provided in the Draft Solar PEIS remain valid. The boundaries of the proposed SEZ remain the same, but about 253 acres (1.0 $km^2$) of non-development areas have now been identified. Non-development areas include Ione Wash and a small wetland area in the southern portion of the SEZ.

#### *11.7.7.1.2 Soil Resources*

Data provided in the Draft Solar PEIS remain valid, with the following update:

- Soil unit coverage at the proposed Millers SEZ as revised is summarized in Table 11.7.7.1-1, which provides revised areas for soil map units taking into account non-development areas.

### 11.7.7.2 Impacts

Impacts on soil resources would occur mainly as a result of ground-disturbing activities (e.g., grading, excavating, and drilling), especially during the construction phase of a solar project. Because the developable area of the SEZ has changed by less than 5%, the assessment of impacts provided in the Draft Solar PEIS remains valid, with the following updates:

- Impacts related to wind erodibility are somewhat reduced because the identification of non-development areas eliminates 224 acres (0.91 $km^2$) of moderately erodible soils and 28 acres (0.11 $km^2$) of highly erodible soils (Yomba-Wardenot-Izo and Yomba-Kawich associations) from development.

**TABLE 11.7.7.1-1 Summary of Soil Map Units within the Proposed Millers SEZ as Revised**

| Map Unit Symbol[a] | Map Unit Name | Erosion Potential | | Description | Area, in Acres[d] (percentage of SEZ) |
|---|---|---|---|---|---|
| | | Water[b] | Wind[c] | | |
| 162 | Yomba–Playas–Youngston association, alkali | Low | Moderate (WEG 4L)[e] | Consists of about 40% Yomba gravelly sand and 25% Playas (silty clay loam). Level to moderately sloping soils on alluvial flats, playas, and drainageways. Parent material is alluvium from mixed sources. Very deep and very poorly (Playas) to somewhat excessively drained, with moderate surface runoff potential and moderately slow to slow permeability. Available water capacity is very low (Playas) to low. Severe rutting hazard. Used mainly for livestock grazing and wildlife habitat. | 4,068 (24.2)[f] |
| 131 | Belcher–Playas–Yomba association | Low | High (WEG 2) | Consists of 45% Belcher gravelly sand, 20% Yomba gravelly fine sandy loam, and 20% Playas (silty clay loam). Level to nearly level soils on alluvial flats and playas. Parent material is alluvium from mixed sources. Shallow to a duripan (Belcher) and very deep and very poorly (Playas) to somewhat excessively drained, with high surface-runoff potential (very slow infiltration rate) and moderate to moderately rapid permeability. Available water capacity is very low to low. Moderate rutting hazard. Used mainly for wildlife grazing, wildlife habitat, and irrigated cropland (alfalfa, corn silage, and small grains). | 4,030 (24.0) |
| 160 | Yomba–Playas–Youngston association | Low | Moderate (WEG 4L) | Consists of 40% Yomba gravelly sand, 25% Playas (silty clay loam), and 20% Youngston silt loam. Level to moderately sloping soils on alluvial flats, playas, and drainageways. Parent material is alluvium from mixed sources. Very deep and very poorly (Playas) to somewhat excessively drained, with moderate surface-runoff potential and moderately slow to slow permeability. Available water capacity is very low (Playas) to high. Severe rutting hazard. Used mainly for livestock grazing and wildlife habitat. | 3,654 (21.8)[g] |

**TABLE 11.7.7.1-1 (Cont.)**

| Map Unit Symbol[a] | Map Unit Name | Erosion Potential Water[b] | Erosion Potential Wind[c] | Description | Area, in Acres[d] (percentage of SEZ) |
|---|---|---|---|---|---|
| 163 | Yomba–Playas–Kawich association | Moderate | High (WEG 1) | Consists of 30% Yomba gravelly sand, 30% Playas (silty clay loam), and 30% Kawich fine sand. Level to sloping soils on sand sheets (Kawich on stabilized sand dunes), alluvial flats, and playas. Parent material is alluvium from mixed sources and eolian sand. Very deep and very poorly (Playas) to excessively drained, with low surface-runoff potential (high infiltration rate) and moderate to very rapid permeability. Available water capacity is very low (Playas) to low. Moderate rutting hazard. Used mainly for livestock grazing and wildlife habitat. | 2,262 (13.5) |
| 161 | Yomba–Wardenot–Izo association | Slight | High (WEG 2) | Consists of 45% Yomba gravelly sand, 25% Wardenot gravelly fine sandy loam, and 15% Izo very gravelly sand. Level to sloping soils formed on alluvial flats and fan skirts. Parent material is alluvium from mixed sources. Very deep and somewhat excessively to excessively drained, with moderate surface-runoff potential and moderate to rapid permeability. Available water capacity is very low to low. Moderate rutting hazard. Used mainly for grazing and wildlife habitat. | 1,803 (10.7)[h] |
| 164 | Yomba–Kawich association | Slight | High (WEG 2) | Consists of 50% Yomba gravelly sand and 35% Kawich fine sand. Level to sloping soils on alluvial flats and fan skirts (Kawich on stabilized sand dunes). Parent material is alluvium from mixed sources. Very deep and somewhat excessively to excessively drained, with low surface-runoff potential (high infiltration rate) and moderate to very rapid permeability. Available water capacity is very low to low. Moderate rutting hazard. Used mainly as livestock grazing and wildlife habitat. | 602 (3.6)[i] |

**TABLE 11.7.7.1-1 (Cont.)**

| Map Unit Symbol[a] | Map Unit Name | Erosion Potential Water[b] | Erosion Potential Wind[c] | Description | Area, in Acres[d] (percentage of SEZ) |
|---|---|---|---|---|---|
| 180 | Youngston–Playas association | Moderate | Moderate (WEG 4L) | Consists of 60% Youngston silt loam and 25% Playas (silty clay loam). Level to nearly level soils on alluvial flats and playas. Parent material is alluvium from mixed sources. Very deep and very poorly (Playas) to well drained, with moderate surface-runoff potential and moderately slow permeability. Available water capacity is very low (Playas) to high. Severe rutting hazard. Used mainly for livestock grazing, wildlife habitat, and irrigated cropland (alfalfa, corn silage, and small grains). | 182 (1.1) |
| 430 | Slaw–Playas complex | Moderate | Moderate (WEG 4L) | Consists of 45% Slaw loam and 40% Playas (silty clay loam). Level to nearly level soils on alluvial flats and playas. Parent material is alluvium from mixed sources. Very deep and very poorly (Playas) to well drained, with high surface-runoff potential (slow infiltration rate) and slow permeability. Available water capacity is very low (Playas) to high. Severe rutting hazard. Used mainly for livestock grazing and wildlife habitat. | 137 (<1)[j] |

a Map unit symbols are shown in Figure 11.7.7.1-5 of the Draft Solar PEIS.

b Water erosion potential rates based on soil erosion factor K, which indicates the susceptibility of soil to sheet and rill erosion by water. Values range from 0.02 to 0.69 and are provided in parentheses under the general rating; a higher value indicates a higher susceptibility to erosion. Estimates are based on the percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity. A rating of “slight” indicates that erosion is unlikely under ordinary climatic conditions. A rating of “moderate” indicates that erosion could be expected under ordinary climatic conditions.

c Wind erosion potential here is based on the wind erodibility group (WEG) designation: groups 1 and 2, high; groups 3 through 6, moderate; and groups 7 and 8, low (see footnote d for further explanation).

d To convert from acres to km$^2$, multiply by 0.004047.

**Footnotes continued on next page.**

**TABLE 11.7.7.1-1 (Cont.)**

[e] WEGs are based on soil texture, content of organic matter, effervescence of carbonates, content of rock fragments, and mineralogy, and also take into account soil moisture, surface cover, soil surface roughness, wind velocity and direction, and the length of unsheltered distance (USDA 2004). Groups range in value from 1 (most susceptible to wind erosion) to 8 (least susceptible to wind erosion). The NRCS provides a wind erodibility index, expressed as an erosion rate in tons per acre per year, for each of the wind erodibility groups: WEG 1, 220 tons (200 metric tons) per acre (4,000 $m^2$) per year (average); WEG 2, 134 tons (122 metric tons) per acre (4,000 $m^2$) per year; WEGs 3 and 4 (and 4L), 86 tons (78 metric tons) per acre (4,000 $m^2$) per year; WEG 5, 56 tons (51 metric tons) per acre (4,000 $m^2$) per year; WEG 6, 48 tons (44 metric tons) per acre (4,000 $m^2$) per year; WEG 7, 38 tons (34 metric tons) per acre (4,000 $m^2$) per year; and WEG 8, 0 tons (0 metric tons) per acre (4,000 $m^2$) per year.

[f] A total of 24 acres (0.097 $km^2$) within the Yomba–Playas–Youngston association, alkali is currently categorized as a non-development area.

[g] A total of 142 acres (0.57 $km^2$) within the Yomba–Playas–Youngston association is currently categorized as a non-development area.

[h] A total of 2 acres (0.0081 $km^2$) within the Yomba–Wardenot–Izo association is currently categorized as a non-development area.

[i] A total of 26 acres (0.11 $km^2$) within the Yomba–Kawich association is currently categorized as a non-development area.

[j] A total of 58 acres (0.23 $km^2$) within the Slaw–Playas association is currently categorized as a non-development area.

Source: NRCS (2010).

- Impacts related to water erodibility are somewhat reduced because the identification of non-development areas eliminates 58 acres (0.23 $km^2$) of moderately erodible soils from development.

#### 11.7.7.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on soils are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will reduce the potential for soil impacts during all project phases.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features for soil resources were identified at the proposed Millers SEZ. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.7.8 Minerals (Fluids, Solids, and Geothermal Resources)

A mineral potential assessment for the proposed Millers SEZ has been prepared and reviewed by BLM mineral specialists knowledgeable about the region where the SEZ is located (BLM 2012). The BLM is proposing to withdraw the SEZ from settlement, sale, location, or entry under the general land laws, including the mining laws, for a period of 20 years (see Section 2.2.2.2.4 of the Final Solar PEIS). The potential impacts of this withdrawal are discussed in Section 11.7.24.

#### 11.7.8.1 Affected Environment

The description in the Draft Solar PEIS remains valid. There are no locatable mining claims, no active oil and gas leases, and no active or historical geothermal developments in or near the Millers SEZ.

#### 11.7.8.2 Impacts

There are no identified conflicts with mineral resources present. The description of the proposed SEZ in the Draft Solar PEIS is still accurate. If identified as an SEZ, it would continue to be closed to all incompatible forms of mineral development. Some future development of oil and gas resources beneath the SEZ would be possible, and production of common minerals could take place in areas not directly developed for solar energy production.

#### 11.7.8.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on mineral resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide adequate protection of mineral resources.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features for mineral resources have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.7.9 Water Resources

#### 11.7.9.1 Affected Environment

The description of the affected environment given in the Draft Solar PEIS relevant to water resources at the proposed Millers SEZ remains valid and is summarized in the following paragraphs.

The Millers SEZ is within the Central Nevada Desert subbasin of the Great Basin hydrologic region. The SEZ is located in the southern half of the Big Smokey Valley known as "Tonopah Flat." The average precipitation is 5 in./yr (13 cm/yr); average snowfall is 13 in./yr (33 cm/yr); and evapotranspiration rates have been estimated to be approximately 58 in./yr (147 cm/yr). There are no perennial surface water features in the proposed Millers SEZ. Intermittent stream channels of Peavine Creek and Ione Wash flow in a southwestern direction across the SEZ toward the dry lake areas in the southwestern portion of Big Smoky Valley. Approximately 2,200 acres (9 km$^2$) of the northwestern portion of the SEZ is located in the base of an alluvial fan containing several distributary intermittent/ephemeral stream channels. Wetlands near the proposed SEZ are generally less than 200 acres (0.8 km$^2$), and there are no significant wetlands within the area. Flood hazards have not been identified for the SEZ area but have been mapped for the adjacent Nye County, indicating that the braided intermittent channels of Peavine Creek and Ione Wash would likely be within a 100-year floodplain. A total of 253 acres (1 km$^2$) associated with the Ione Wash channel in the SEZ has been identified as a non-development area. The proposed Millers SEZ is located within the Big Smokey Valley–Tonopath Flat groundwater basin, which covers an area of 1,025,900 acres (4,152 km$^2$), with groundwater primarily in the basin-fill aquifer, which consists of lenses of gravels, sands, and clays that are typically 1,500 to 2,500 ft (457 to 762 m) thick near the SEZ. Groundwater recharge in the basin has been estimated to range from 2,807 to 4,060 ac-ft/yr (3.5 million to 5.0 million m$^3$/yr), and groundwater generally flows from northeast to southwest. Depth to groundwater ranges from 8 to 78 ft (2 to 24 m) in the vicinity of the SEZ, and the quality of the groundwater generally meets drinking water standards.

All waters in Nevada are public property, and the NDWR is the agency responsible for managing both surface and groundwater resources. Approximately 1,300 acres (5.3 $km^2$) of the proposed SEZ falls under State Engineer's Order 828 (NDWR 1983), which designates municipal and domestic water uses as the preferred beneficial use in the Tonapah Flat groundwater basin. The annual yield of the Tonapah Flat groundwater basin is set at 6,000 ac-ft/yr (7.4 million $m^3$/yr); water rights in the basin are over-appropriated, with a total 23,930 ac-ft/yr (29.5 million $m^3$/yr) allotted for primarily mining and irrigation (NDWR 2012). Solar energy developers would have to submit applications for new groundwater withdrawals or transfer of existing water rights under the review of the NDWR.

In addition to the water resources information provided in the Draft Solar PEIS, this section provides a planning-level inventory of available climate, surface water, and groundwater monitoring stations within the immediate vicinity of the Millers SEZ and surrounding basin. Additional data regarding climate, surface water, and groundwater conditions are presented in Tables 11.7.9.1-1 through 11.7.9.1-7 and in Figures 11.7.9.1-1 and 11.7.9.1-2. Fieldwork and hydrologic analyses needed to determine 100-year floodplains and jurisdictional water bodies would need to be coordinated with appropriate federal, state, and local agencies. Areas within the Millers SEZ that are found to be within a 100-year floodplain will be identified as non-development areas. Any water features within the Millers SEZ determined to be jurisdictional will be subject to the permitting process described in the CWA.

### 11.7.9.2 Impacts

#### *11.7.9.2.1 Land Disturbance Impacts on Water Resources*

The discussion of land disturbance effects on water resources in the Draft Solar PEIS remains valid. As stated in the Draft Solar PEIS, land disturbance impacts in the vicinity of the

**TABLE 11.7.9.1-1 Watershed and Water Management Basin Information Relevant to the Proposed Millers SEZ as Revised**

| Basin | Name | Area (acres)[b] |
|---|---|---|
| Subregion (HUC4)[a] | Central Nevada Desert Basins (1606) | 30,541,692 |
| Cataloging unit (HUC8) | Southern Big Smoky Valley (16060003) | 1,312,034 |
| Groundwater basin | Big Smokey Valley, Tonopah Flat | 1,025,920 |
| SEZ | Millers | 16,787 |

[a] HUC = Hydrologic Unit Code; a USGS system for characterizing nested watersheds that includes large-scale subregions (HUC4) and small-scale cataloging units (HUC8).

[b] To convert acres to $km^2$, multiply by 0.004047.

**TABLE 11.7.9.1-2 Climate Station Information Relevant to the Proposed Millers SEZ as Revised**

| Climate Station (COOP ID[a]) | Elevation[b] (ft)[c] | Distance to SEZ (mi)[d] | Period of Record | Mean Annual Precipitation (in.)[e] | Mean Annual Snowfall (in.) |
|---|---|---|---|---|---|
| Coaldale Junction, Nevada (261755) | 4,603 | 24 | 1941–1970 | 3.35 | 7.70 |
| Goldfield, Nevada (263285) | 5,690 | 35 | 1906–2009 | 6.06 | 17.80 |
| Mina, Nevada (265168) | 4,550 | 36 | 1896–2011 | 4.51 | 7.20 |
| Tonopah AP, Nevada (268170) | 5,426 | 22 | 1954–2011 | 5.06 | 13.00 |

[a] National Weather Service's Cooperative Station Network station identification code.

[b] Surface elevations for the proposed Millers SEZ range from 4,775 to 4,865 ft.

[c] To convert ft to m, multiply by 0.3048.

[d] To convert mi to km, multiply by 1.6093.

[e] To convert in. to cm, multiply by 2.540.

Source: NOAA (2012).

**TABLE 11.7.9.1-3 Total Lengths of Selected Streams at the Subregion, Cataloging Unit, and SEZ Scale Relevant to the Proposed Millers SEZ as Revised**

| Water Feature | Subregion, HUC4 (ft)[a] | Cataloging Unit, HUC8 (ft) | SEZ (ft) |
|---|---|---|---|
| Unclassified streams | 87,719 | 0 | 0 |
| Perennial streams | 10,923,723 | 218,469 | 0 |
| Intermittent/ephemeral streams | 724,309,083 | 36,535,020 | 93,077 |
| Canals | 4,035,992 | 138,426 | 0 |

[a] To convert ft to m, multiply by 0.3048.

Source: USGS (2012b).

proposed Millers SEZ could potentially affect drainage patterns, intermittent/ephemeral flows in Ione Wash and Peavine Creek, along with groundwater recharge and discharge properties. The alteration of natural drainage pathways during construction can lead to impacts related to flooding, loss of water delivery to downstream regions, and alterations to riparian vegetation and habitats. The identification of non-development areas associated with Ione Wash was done by using low-resolution data from the National Hydrography Dataset (USGS 2012a), which did not completely capture the braided channels of Ione Wash as shown in Figure 11.7.9.1-1 of this Final Solar PEIS.

**TABLE 11.7.9.1-4  Stream Discharge Information Relevant to the Proposed Millers SEZ as Revised**

| Parameter | Station (USGS ID) Big Smoky Valley Tributary near Blair Junction, Nevada (10249680) | Big Smoky Valley Tributary near Tonopah, Nevada (10249620) |
|---|---|---|
| Period of record | 1961–1989 | 1961–1985 |
| No. of observations | 23 | 25 |
| Discharge, median ($ft^3$/s)[a] | 0 | 0.7 |
| Discharge, range ($ft^3$/s) | 0–10 | 0–460 |
| Discharge, most recent observation ($ft^3$/s) | 0 | 460 |
| Distance to SEZ (mi)[b] | 16 | 17 |

[a] To convert $ft^3$ to $m^3$, multiply by 0.0283.

[b] To convert mi to km, multiply by 1.6093.

Source: USGS (2012b).

**TABLE 11.7.9.1-5  Surface Water Quality Data Relevant to the Proposed Millers SEZ as Revised[a]**

| Station (USGS ID) | Period of Record | No. of Records |
|---|---|---|
| No water quality data are available for surface water stations in the SEZ's HUC8 watershed. | NA[a] | NA |

[a] NA = no data collected for this parameter.

Source: USGS (2012b).

Land clearing, land leveling, and vegetation removal during the development of the SEZ have the potential to disrupt intermittent/ephemeral stream channels. Several programmatic design features described in Section A.2.2 of Appendix A of this Final Solar PEIS would avoid, minimize, and/or mitigate impacts associated with the disruption of intermittent/ephemeral water features. Additional analyses of intermittent/ephemeral streams are presented in this update, including an evaluation of functional aspects of stream channels with respect to groundwater recharge, flood conveyance, sediment transport, geomorphology, and ecological habitats. Only a summary of the results from these surface water analyses is presented in this section; more information on methods and results is presented in Appendix O.

**TABLE 11.7.9.1-6 Water Quality Data from Groundwater Samples Relevant to the Proposed Millers SEZ as Revised**

| Parameter | Station (USGS ID)[a] 383220117034000 | 382328117262501 |
|---|---|---|
| Period of record | 1967–1967 | 2003–2003 |
| No. of records | 2 | 2 |
| Temperature (°C)[b] | 9.5 (9.5–9.5) | 19.8 (19.5–20.1) |
| Total dissolved solids (mg/L) | NA[c] | 362.5 (361–364) |
| Dissolved oxygen (mg/L) | NA | 6.45 (6–6.9) |
| pH | NA | 7.6 (7.5–7.7) |
| Nitrate (mg/L as N) | 0.86 | 2.745 (2.73–2.76) |
| Phosphate (mg/L) | < 0.010 | 0.043 (0.031–< 0.055) |
| Organic carbon (mg/L) | NA | NA |
| Calcium (mg/L) | 123 | NA |
| Magnesium (mg/L) | 18 | NA |
| Sodium (mg/L) | 26 | NA |
| Chloride (mg/L) | 13 | NA |
| Sulfate (mg/L) | 202 | NA |
| Arsenic (µg/L) | 0 | NA |

[a] Median values are listed; the range in values is shown in parentheses.

[b] To convert °C to °F, multiply by 1.8, then add 32.

[c] NA = no data collected for this parameter.

Source: USGS (2012b).

The study region considered for the intermittent/ephemeral stream evaluation relevant to the Millers SEZ is a subset of the Southern Big Smoky Valley watershed (HUC8), for which information regarding stream channels is presented in Tables 11.7.9.1-3 and 11.7.9.1-4 of this Final Solar PEIS. The results of the intermittent/ephemeral stream evaluation are shown in Figure 11.7.9.2-1, which depicts flow lines from the National Hydrography Dataset (USGS 2012a) labeled as low, moderate, and high sensitivity to land disturbance. Within the study area, 16% of the intermittent/ephemeral stream channels had low sensitivity, 76% had moderate sensitivity, and 8% had high sensitivity to land disturbance. The intermittent/ephemeral stream channels associated with the alluvial fan feature in the northwest portion of the SEZ were identified as having a moderate sensitivity, while the intermittent reaches of Ione Wash and Peavine Creek within the SEZ were primarily identified as having low sensitivity to land disturbance (Figure 11.7.9.2-1).

### *11.7.9.2.2 Water Use Requirements for Solar Energy Technologies*

The water use requirements for full build-out scenarios of the Millers SEZ have not changed from the values presented in the Draft Solar PEIS (see Tables 11.7.9.2-1 and 11.7.9.2-2

**TABLE 11.7.9.1-7 Groundwater Surface Elevations Relevant to the Proposed Millers SEZ as Revised**

| | Monitoring Station (USGS ID) | | | | |
|---|---|---|---|---|---|
| Parameter | 375821117440201 | 381906117232001 | 380645117315801 | 380830117272001 | 381345117230501 |
| Period of record | 1969 | 1966–1984 | 1969 | 1952–1975 | 1981 |
| No. of observations | 1 | 3 | 1 | 12 | 1 |
| Surface elevation (ft)[a] | 4,742 | 5,301 | 4,773 | 4,790 | 4,881 |
| Well depth (ft) | 97 | 100 | NA[c] | 61 | 150 |
| Depth to water, median (ft) | 47.56 | 69.1 | 8.34 | 39.34 | 78 |
| Depth to water, range (ft) | – | 67.7–69.1 | – | 0–58.38 | – |
| Depth to water, most recent observation (ft) | 47.56 | 67.7 | 8.34 | 58.38 | 78 |
| Distance to SEZ (mi)[b] | 19 | 11 | 5 | 3 | 7 |

[a] To convert ft to m, multiply by 0.3048.

[b] To convert mi to km, multiply by 1.6093.

[c] NA = no data collected for this parameter.

Source: USGS (2012b).

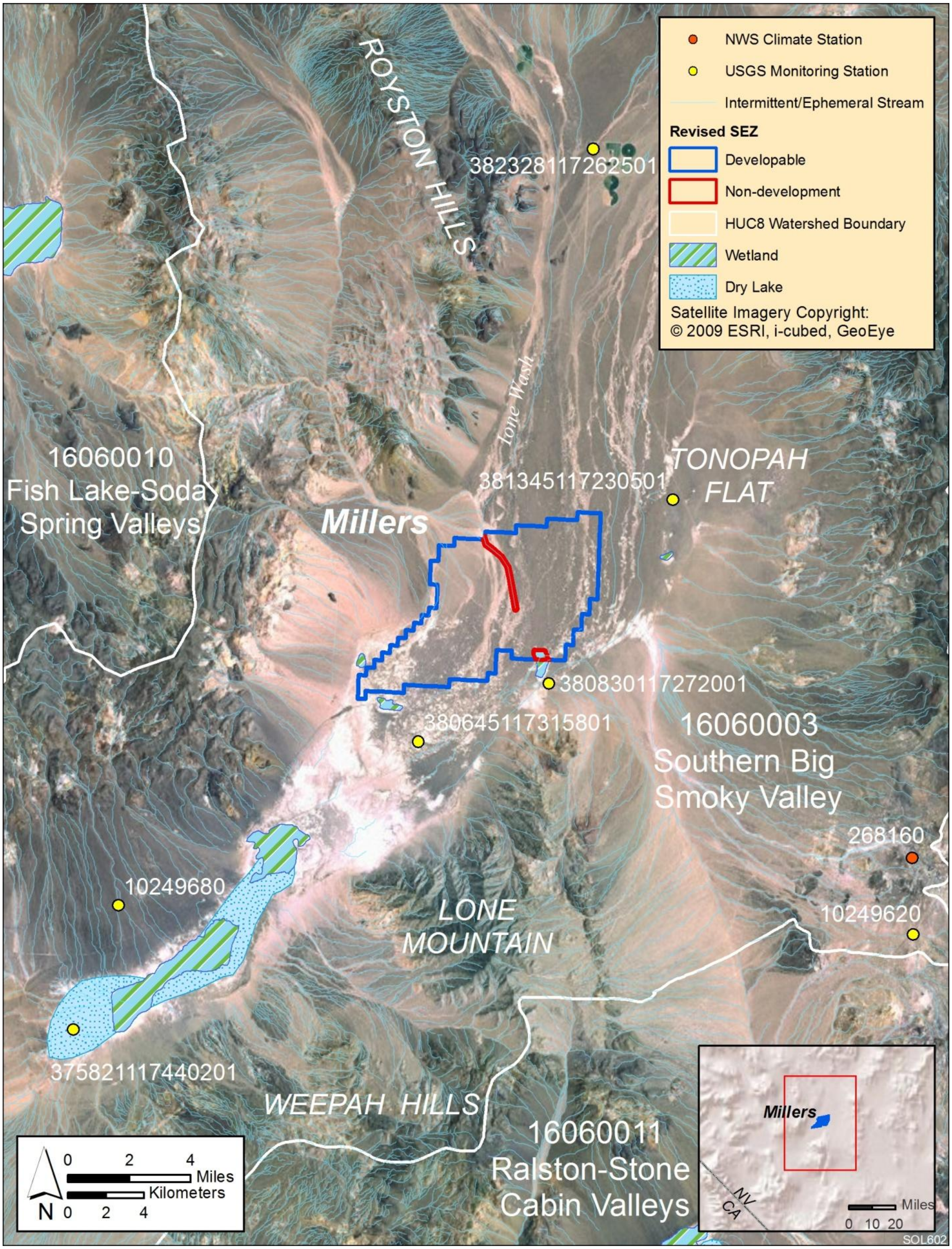


**FIGURE 11.7.9.1-1 Water Features near the Proposed Millers SEZ as Revised**

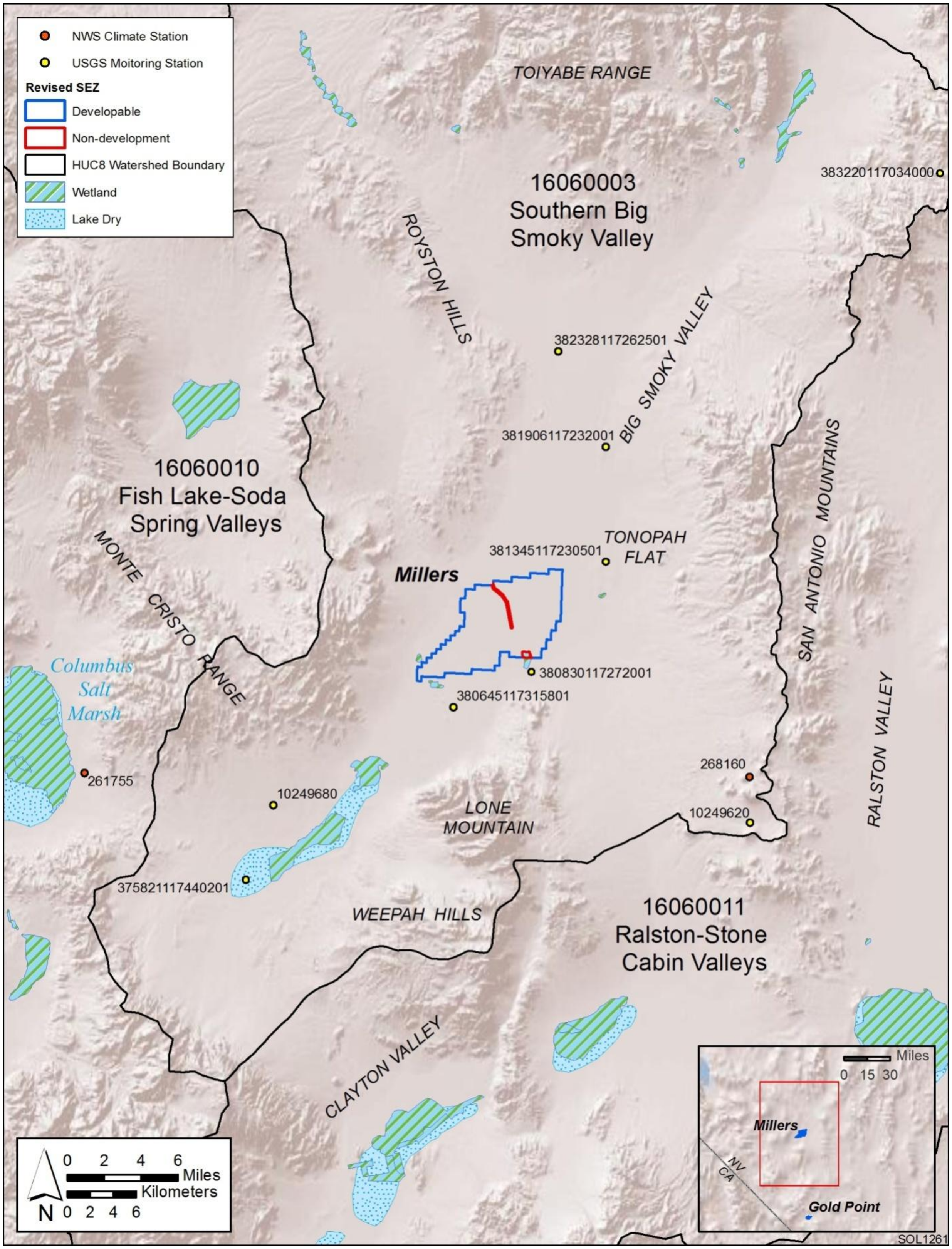


**FIGURE 11.7.9.1-2 Water Features within the Southern Big Smoky Valley Watershed, Which Includes the Proposed Millers SEZ as Revised**

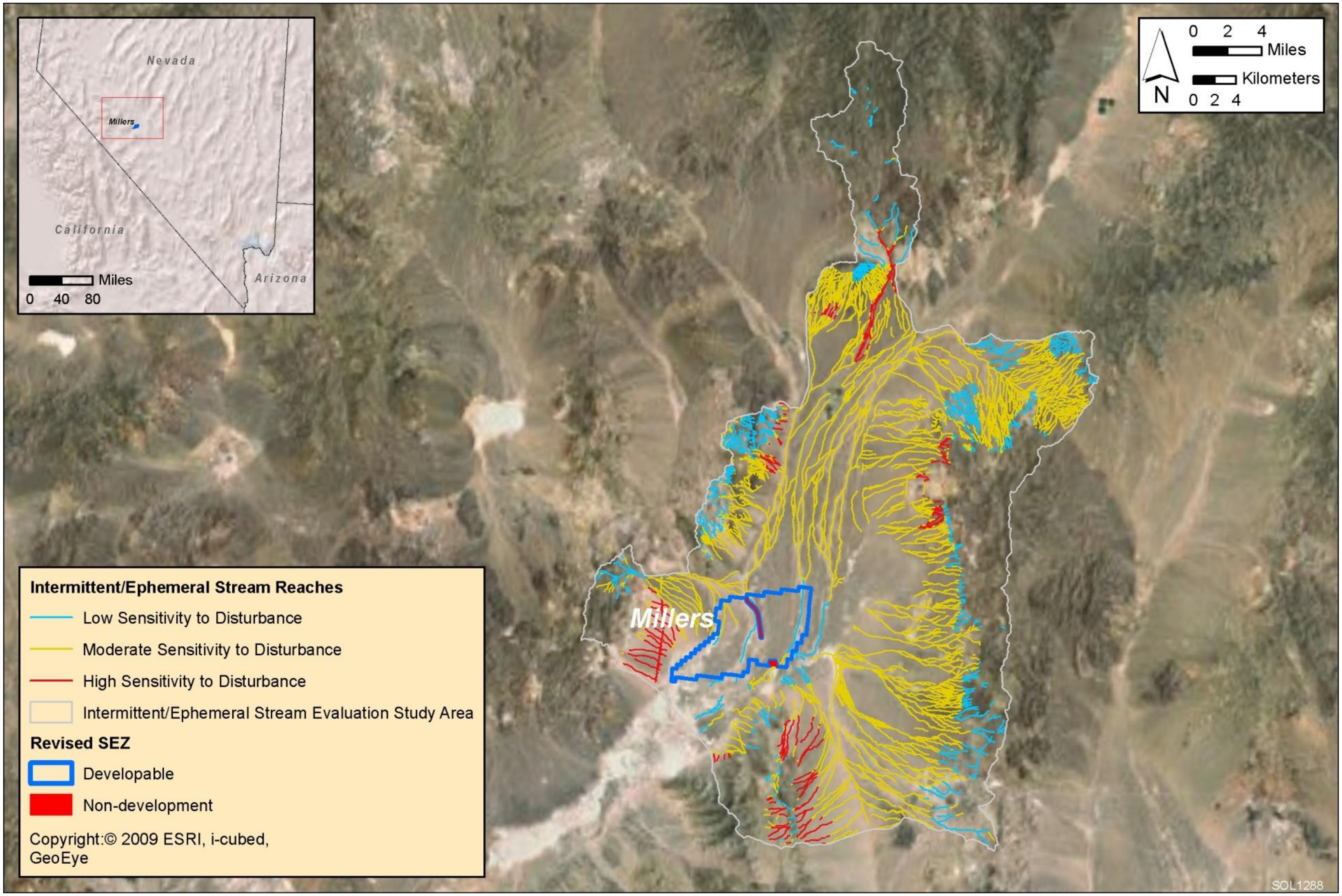


**FIGURE 11.7.9.2-1 Intermittent/Ephemeral Stream Channel Sensitivity to Surface Disturbances in the Vicinity of the Proposed Millers SEZ as Revised**

**TABLE 11.7.9.2-1 Groundwater Budget for the Big Smoky Valley-Tonopah Flat Groundwater Basin, Which Includes the Proposed Millers SEZ as Revised**

| Process | Amount[a] |
|---|---|
| *Inputs* | |
| Total recharge (ac-ft/yr) | 4,000[b]–12,000 |
| Subsurface underflow (ac-ft/yr) | 2,000–3,000 |
| *Outputs* | |
| Subsurface outflow (ac-ft/yr) | 8,000 |
| Evapotranspiration (ac-ft/yr) | 6,000 |
| Discharge to springs (ac-ft/yr) | 230 |
| Groundwater withdrawals (ac-ft/yr) | Unknown |
| Permitted water rights (ac-ft/yr) | 23,930[c] |
| *Storage* | |
| Storage (ac-ft) | 5,000,000–7,000,000[d] |
| Perennial yield (ac-ft/yr) | 6,000[e] |

[a] To convert ac-ft to $m^3$, multiply by 1,234.

[b] Flint et al. (2004).

[c] NDWR (2012).

[d] Storage estimates include the northern Big Smoky Valley basin.

[e] Defined by the NDWR.

Source: Rush and Schroer (1971).

in the Draft Solar PEIS). This section presents additional analyses pertaining to groundwater, which include a basin-scale groundwater budget and a simplified, one-dimensional groundwater model of potential groundwater drawdown. Only a summary of the results from these groundwater analyses is presented in this section; more information on methods and results is presented in Appendix O.

The estimated total water use requirements during the peak construction year are as high as 3,300 ac-ft/yr (4.1 million $m^3$/yr). The total annual water requirements for operations can be categorized as low, medium, and high groundwater pumping scenarios that represent full build-out of the SEZ assuming PV, dry-cooled parabolic trough, and wet-cooled parabolic trough, respectively (a 30% operational time was considered for all solar facility types on the basis of operations estimates for utility-scale solar energy facilities). This categorization results in water use estimates that range from 77 to 13,468 ac-ft/yr (95,000 to 16.6 million $m^3$/yr), or a total of 1,540 to 269,360 ac-ft (1.9 million to 332 million $m^3$) over the 20-year operation period.

**TABLE 11.7.9.2-2 Aquifer Characteristics and Assumptions Used in the One-Dimensional Groundwater Model for the Proposed Millers SEZ as Revised**

| Parameter | Value[a] |
|---|---|
| Aquifer type/conditions | Basin fill/unconfined |
| Aquifer thickness (ft) | 1,500–2,500 |
| Transmissivity ($ft^2$/day) | 3,300–6,600 (4,950) |
| Specific yield | 0.15 |
| Analysis period (yr) | 20 |
| High pumping scenario (ac-ft/yr)[b] | 13,468 |
| Medium pumping scenario (ac-ft/yr) | 1,918 |
| Low pumping scenario (ac-ft/yr) | 77 |

[a] Values in parentheses used for model.

[b] To convert ac-ft to $m^3$, multiply by 1,234.

Source: Rush and Schroer (1971).

The estimated groundwater withdrawal rates were compared to the basin-scale groundwater budget for the Big Smoky Valley-Tonopah Flat groundwater basin shown in Table 11.7.9.2-1. The peak construction year water requirements range from 28 to 83% of the total recharge to the basin. Impacts associated with peak construction year water requirements are minimal, considering the short duration of this water demand relative to the groundwater resources in the basin. The long duration of groundwater pumping during operations (20 years) poses a greater threat to groundwater resources. The high pumping scenario represents 224% of the perennial yield and between 112% and 337% of the basin-scale recharge on an annual basis, and 5% of the groundwater storage over the 20-year operations period (Figure 11.7.9.2-2). Significant groundwater impacts are expected with this level of groundwater pumping. The medium pumping scenario represents 32% of the perennial yield and between 16% and 48% of the basin-scale recharge on an annual basis, and less than 1% of the groundwater storage over the 20-year operations period. The low pumping scenario represents approximately 1% of the perennial yield and basin-scale recharge. The low pumping scenario would have minimal impacts on groundwater resources, while the medium pumping scenario could have some localized impacts on water resources given its magnitude relative to the basin-scale recharge.

Groundwater budgeting allows for quantification of complex groundwater processes at the basin scale, but it ignores the temporal and spatial components of how groundwater withdrawals affect groundwater surface elevations, groundwater flow rates, and connectivity to surface water features such as streams, wetlands, playas, and riparian vegetation. A one-dimensional groundwater modeling analysis was performed to present a simplified depiction of the spatial and temporal effects of groundwater withdrawals by examining groundwater drawdown in a radial direction around the center of the SEZ for the low, medium, and high

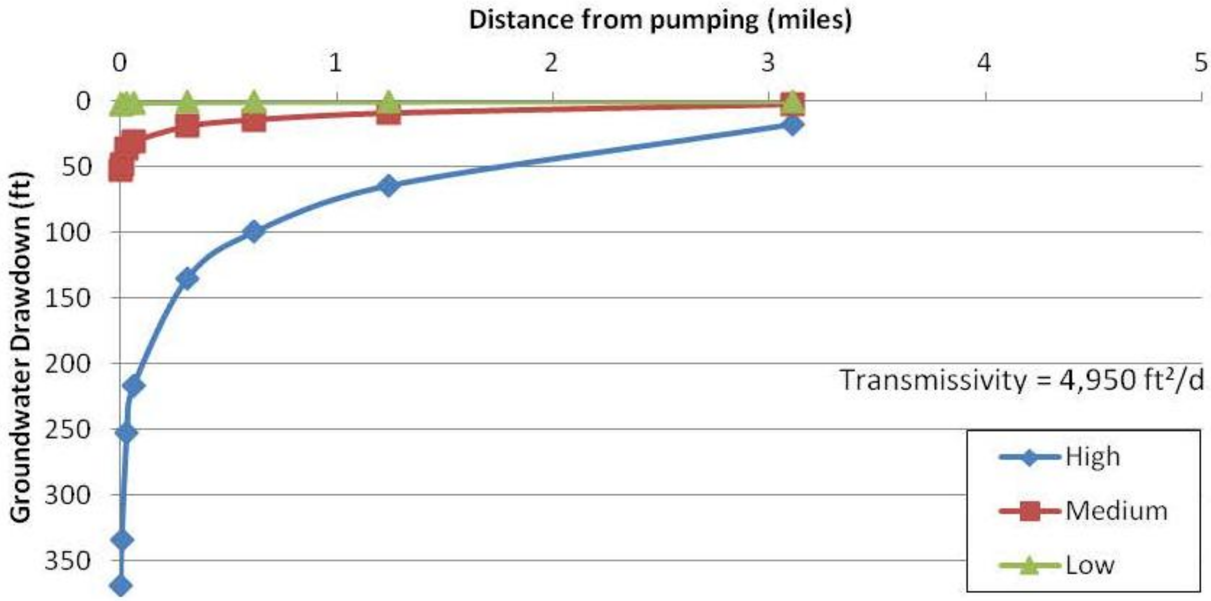


**FIGURE 11.7.9.2-2  Estimated One-Dimensional Groundwater Drawdown Resulting from High, Medium, and Low Groundwater Pumping Scenarios over the 20-Year Operational Period at the Proposed Millers SEZ as Revised**

pumping scenarios. A detailed discussion of the groundwater modeling analysis is presented in Appendix O. Note, however, that the aquifer parameters used for the one-dimensional groundwater model (Table 11.7.9.2-2) represent available literature data, and that the model aggregates these value ranges into a simplistic representation of the aquifer.

Depth to groundwater ranges from 8 to 78 ft (2 to 24 m) in the vicinity of the SEZ. The one-dimensional groundwater modeling results suggest that groundwater withdrawals for solar energy development would result in groundwater drawdown in the vicinity of the SEZ (approximately a 3-mi [5-km] radius) that ranges up to 360 ft (110 m) for the high pumping scenario, up to 50 ft (15 m) for the medium pumping scenario, and less than 1 ft (0.3 m) for the low pumping scenario. The modeling results suggest that groundwater drawdown is localized to the vicinity of the SEZ for all pumping scenarios. However, the groundwater drawdown associated with the high pumping scenario is very substantial and could possibly disrupt groundwater flow, which is from northeast to southwest. A disruption in groundwater flow could potentially affect the wetland and dry lake regions in the southwestern portion of Big Smoky Valley (Figure 11.7.9.1-1).

### *11.7.9.2.3  Off-Site Impacts: Roads and Transmission Lines*

As stated in the Draft Solar PEIS, impacts associated with the construction of roads and transmission lines primarily deal with water use demands for construction, water quality concerns relating to potential chemical spills, and land disturbance effects on the natural hydrology. Water needed for transmission line construction activities (e.g., for soil compaction, dust suppression, and potable supply for workers) could be trucked to the construction area from an off-site source. If this occurred, water use impacts at the SEZ would be negligible. The Draft Solar PEIS assessment of impacts on water resources from road and transmission line construction remains valid.

#### *11.7.9.2.4 Summary of Impacts on Water Resources*

The additional information and analyses of water resources presented in this update agree with information provided in the Draft Solar PEIS, which indicates that the Millers SEZ is located in a high-elevation desert valley where water resources are primarily groundwater, along with intermittent/ephemeral surface water features. Groundwater is primarily found in the basin-fill aquifer that is connected to adjacent valleys. Current groundwater withdrawals for the basin are unknown, but current water right allocations far exceed the perennial yield for the basin set by the NDWR. The majority of water right allocations are committed to mining and irrigation purposes, but it is not known how much of these allotted water rights are in use.

Disturbances to intermittent/ephemeral streams within the Millers SEZ could potentially affect groundwater recharge and ecological habitats, particularly in the vicinity of the alluvial fan in the northwest portion of the SEZ. In addition, portions of the braided stream channel of Ione Wash extend outside the non-development regions of the SEZ. As stated in the Draft Solar PEIS, floodplain maps in the adjacent Nye County suggest that 100-year floodplain areas would be associated with the braided channels of Ione Wash and Peavine Creek, and design features in Appendix A of this Final PEIS describe the need to avoid identified 100-year floodplain areas.

Groundwater withdrawals associated with the high pumping scenario have the potential to cause significant groundwater drawdown in the vicinity of the SEZ. The magnitude of groundwater drawdown could affect groundwater flow patterns, which could limit groundwater supply to the wetland and dry lake areas located in the southwestern portion of Big Smoky Valley. Groundwater withdrawals associated with the low and medium pumping scenarios have much less impact on groundwater drawdown. Aside from these modeled groundwater drawdown ranges, the transfer of water rights in the overallocated Big Smoky Valley–Tonopah Flat groundwater basin may limit the amount of groundwater available for solar energy facilities, which would ultimately be decided by the water right review process conducted by the NDWR.

Predicting impacts associated with groundwater withdrawal is often difficult given the heterogeneity of aquifer characteristics, the long time period between the onset of pumping and its effects, and limited data. One of the primary mitigation measures to protect water resources is the implementation of long-term monitoring and adaptive management (see Section A.2.4 of Appendix A). For groundwater, this requires the combination of monitoring and modeling to fully identify the temporal and spatial extent of potential impacts. The framework for a long-term monitoring program would need to be created for the Millers SEZ once development planning begins.

### 11.7.9.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on surface water and groundwater are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some protection of and reduce impacts on water resources.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, the following SEZ-specific design feature has been identified:

- Groundwater analyses suggest that full build-out of wet-cooled technologies is not feasible; for mixed-technology development scenarios, any proposed wet-cooled projects should utilize water conservation practices.

The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.7.10 Vegetation

### 11.7.10.1 Affected Environment

The Millers SEZ was revised to identify 253 acres (1.0 km$^2$) along Ione Wash and a wetland located in the southeast portion of the SEZ as non-development areas.

As presented in Section 11.7.10.1 of the Draft Solar PEIS, 5 cover types were identified within the area of the proposed Millers SEZ, while 15 cover types were identified in the area of indirect effects. Sensitive habitats on the SEZ include desert dry washes, wetland, and playa. Figure 11.7.10.1-1 shows the cover types within the affected area of the Miller SEZ as revised.

### 11.7.10.2 Impacts

As presented in the Draft Solar PEIS, the construction of solar energy facilities within the proposed Millers SEZ would result in direct impacts on plant communities because of the removal of vegetation within the facility footprint during land-clearing and land-grading operations. Approximately 80% of the SEZ would be expected to be cleared with full development of the SEZ. As a result of the changes to the proposed SEZ developable area, approximately 13,227 acres (54 km$^{2)}$ would be cleared.

Overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the cover type within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of a cover type would be lost; and (3) *large*: >10% of a cover type would be lost.

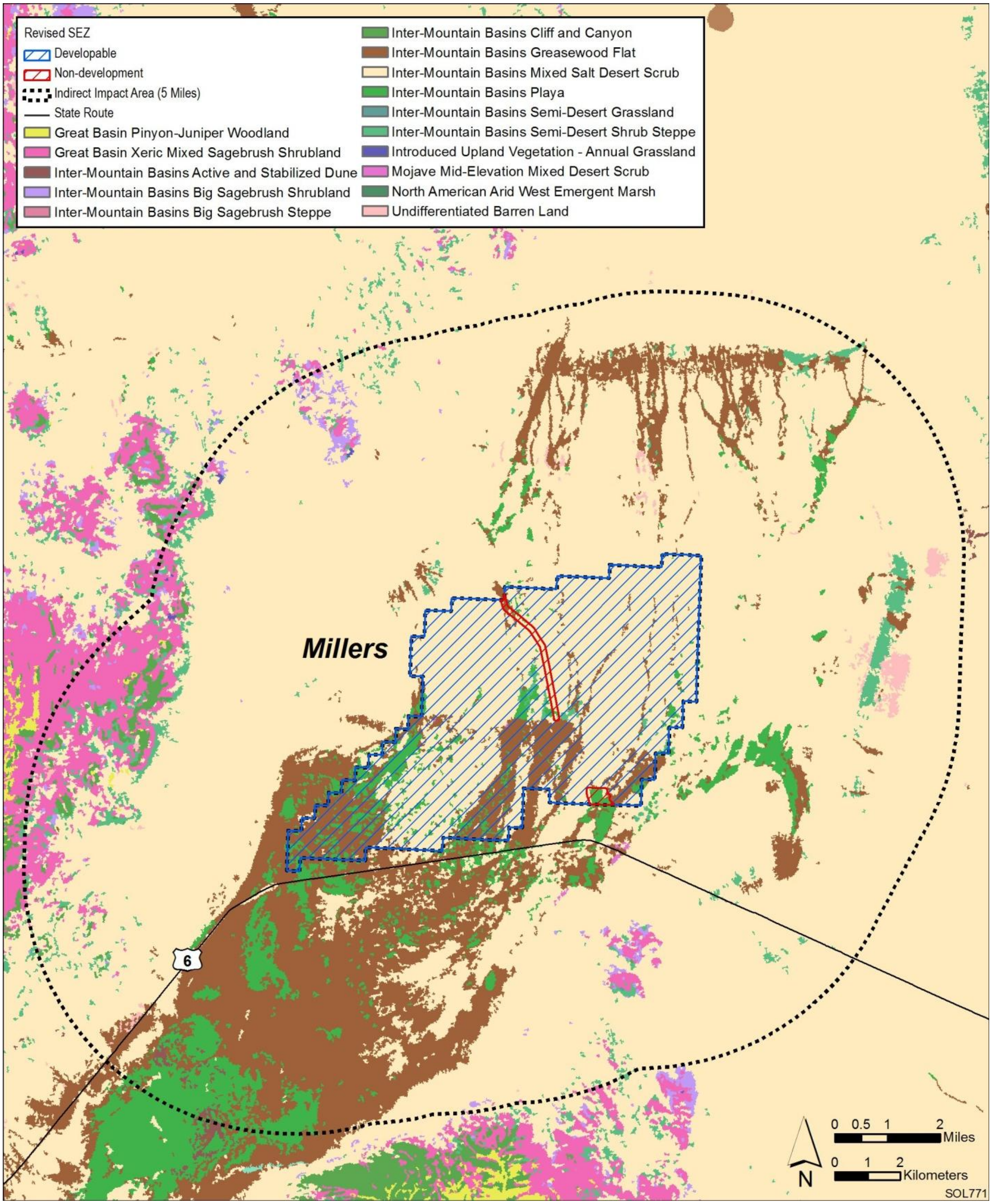


**FIGURE 11.7.10.1-1 Land Cover Types within the Proposed Millers SEZ as Revised**

##### *11.7.10.2.1 Impacts on Native Species*

The analysis presented in the Draft Solar PEIS based on the original Millers SEZ developable area indicated that development would result in a moderate impact on two land cover types and a small impact on all other land cover types occurring within the SEZ (Table 11.7.10.1-1 in the Draft Solar PEIS). Development within the revised Millers SEZ could still directly affect all the cover types evaluated in the Draft Solar PEIS; the impact magnitudes would remain unchanged compared to original estimates in the Draft Solar PEIS.

Direct impacts on dry washes, playas, and unmapped wetlands could still occur. Indirect impacts on habitats associated with wetlands and playas within or near the SEZ, as described in the Draft Solar PEIS, could also occur, including impacts on groundwater-dependent communities in the region, such as those in the vicinity of playas.

##### *11.7.10.2.2 Impacts from Noxious Weeds and Invasive Plant Species*

As presented in the Draft Solar PEIS, land disturbance from project activities and indirect effects of construction and operation within the Millers SEZ could potentially result in the establishment or expansion of noxious weeds and invasive species populations, potentially including those species listed in Section 11.7.10.1 of the Draft Solar PEIS. Impacts such as reduced restoration success and possible widespread habitat degradation could still occur; however, a small reduction in the potential for such impacts would result from the reduced developable area of the SEZ.

#### 11.7.10.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on vegetation are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific species and habitats will determine how programmatic design features are applied, for example:

- Dry washes, playas, and unmapped wetlands within the SEZ shall be avoided to the extent practicable, and any impacts minimized and mitigated in consultation with appropriate agencies. A buffer area shall be maintained around wetlands, playas, and dry washes to reduce the potential for impacts.

- Appropriate engineering controls shall be used to minimize impacts on the playa wetland and other playas, as well as Ione Wash shrub communities, dry washes, and greasewood flat habitats within the SEZ, and downstream occurrences resulting from surface water runoff, erosion, sedimentation, altered hydrology, accidental spills, or fugitive dust deposition to these habitats. Appropriate buffers and engineering controls will be determined through agency consultation.

- Groundwater withdrawals shall be limited to reduce the potential for indirect impacts on plant communities that access groundwater, such as those in the vicinity of playas. Potential impacts on springs associated with the Tonopah Flat basin or other hydrologically connected basins shall be determined through hydrological studies.

- A qualified botanist or plant ecologist should survey for candelaria blazing star (*Mentzelia candelariae*) during a period when it is flowering and easily documented prior to any construction activities within the SEZ. If individuals are located, individuals or populations shall be avoided through fencing and flagging of the area, including an appropriate buffer zone.

It is anticipated that the implementation of these programmatic design features will reduce a high potential for impacts from invasive species and impacts on dry washes, playas, wetlands, and springs to a minimal potential for impact. Residual impacts on groundwater-dependent habitats could result from limited groundwater withdrawal and the like; however, it is anticipated that these impacts would be avoided in the majority of instances.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features for vegetation have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.7.11 Wildlife and Aquatic Biota

For the assessment of potential impacts on wildlife and aquatic biota, overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the species' habitat within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of the species' habitat would be lost; and (3) *large*: >10% of the species' habitat would be lost.

### 11.7.11.1 Amphibians and Reptiles

#### *11.7.11.1.1 Affected Environment*

As presented in the Draft Solar PEIS, representative amphibian and reptile species expected to occur within the Millers SEZ include the Great Plains toad (*Bufo cognatus*), red-spotted toad (*Bufo punctatus*), desert horned lizard (*Phrynosoma platyrhinos*), Great Basin collared lizard (*Crotaphytus bicinctores*), long-nosed leopard lizard (*Gambelia wislizenii*), western fence lizard (*Sceloporus occidentalis*), western whiptail (*Cnemidophorus tigris*), zebra-tailed lizard (*Callisaurus draconoides*), coachwhip (*Masticophis flagellum*), glossy snake (*Arizona elegans*), gophersnake (*Pituophis catenifer*), groundsnake (*Sonora semiannulata*), and nightsnake (*Hypsiglena torquata*).

#### *11.7.11.1.2 Impacts*

As presented in the Draft Solar PEIS, solar energy development within the proposed Millers SEZ could affect potentially suitable habitats for the representative amphibian and reptile species. The analysis presented in the Draft Solar PEIS for the Millers SEZ indicated that development would result in a small overall impact on all representative amphibian and reptile species (Table 11.7.11.1-1 in the Draft Solar PEIS). The reduction in the developable area of the Millers SEZ would result in reduced habitat impacts for all representative amphibian and reptile species; the resultant impact levels for all the representative species would still be small.

#### *11.7.11.1.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on amphibian and reptile species are described in Section A.2.2 of Appendix A of this Final Solar PEIS. With the implementation of required programmatic design features, impacts on amphibian and reptile species will be reduced.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, the following SEZ-specific design feature has been identified:

- Wash and playa habitats should be avoided. The Ione Wash and a small wetland area in the SEZ have been identified as non-development areas, but other avoidable wash and playa habitats may exist within the SEZ.

If SEZ-specific design features are implemented in addition to required programmatic design features, impacts on amphibian and reptile species would be small. The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.7.11.2 Birds

#### *11.7.11.2.1 Affected Environment*

As presented in the Draft Solar PEIS, a large number of bird species could occur or have potentially suitable habitat within the affected area of the proposed Millers SEZ. Representative bird species identified in the Draft Solar PEIS included (1) shorebirds: killdeer (*Charadrius vociferus*); (2) passerines: ash-throated flycatcher (*Myiarchus cinerascens*), Bewick’s wren (*Thryomanes bewickii*), common poorwill (*Phalaenoptilus nuttallii*), common raven (*Corvus corax*), greater roadrunner (*Geococcyx californianus*), horned lark (*Eremophila alpestris*), ladder-backed woodpecker (*Picoides scalaris*), Le Conte’s thrasher (*Toxostoma lecontei*), lesser nighthawk (*Chordeiles acutipennis*), loggerhead shrike (*Lanius ludovicianus*), northern mockingbird (*Mimus polyglottos*), rock wren (*Salpinctes obsoletus*), sage sparrow (*Amphispiza belli*), Say’s phoebe (*Sayornis saya*), and western kingbird (*Tyrannus verticalis*); (3) raptors:

American kestrel (*Falco sparverius*), golden eagle (*Aquila chrysaetos*), great horned owl (*Bubo virginianus*), long-eared owl (*Asio otus*), red-tailed hawk (*Buteo jamaicensis*), and turkey vulture (*Cathartes aura*); and (4) upland gamebirds: chukar (*Alectoris chukar*), Gambel's quail (*Callipepla gambelii*), mourning dove (*Zenaida macroura*), and wild turkey (*Meleagris gallopavo*).

##### *11.7.11.2.2 Impacts*

As presented the Draft Solar PEIS, solar energy development within the Millers SEZ could affect potentially suitable bird habitats. The analysis presented in the Draft Solar PEIS indicated that development would result in a small overall impact on most representative bird species and a moderate impact on the killdeer (Table 11.7.11.2-1 in the Draft Solar PEIS). The reduction in the developable area of the Millers SEZ would result in reduced impacts on habitat for all representative bird species; the resultant impact levels for all the representative bird species would be small. Most habitats suitable for the killdeer are among the areas now identified as undevelopable within the SEZ.

##### *11.7.11.2.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on bird species are described in Section A.2.2 of Appendix A of this Final Solar PEIS. With the implementation of required programmatic design features, impacts on bird species will be reduced.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, the following SEZ-specific design feature has been identified:

- Wash and playa habitats should be avoided. The Ione Wash and a small wetland area in the SEZ have been identified as non-development areas, but other avoidable wash and playa habitats may exist within the SEZ.

If SEZ-specific design features are implemented in addition to required programmatic design features, impacts on bird species would be small. The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

#### 11.7.11.3 Mammals

##### *11.7.11.3.1 Affected Environment*

As presented in the Draft Solar PEIS, a large number of mammal species were identified that could occur or have potentially suitable habitat within the affected area of the proposed Millers SEZ. Representative mammal species identified in the Draft Solar PEIS included (1) big game species: cougar (*Puma concolor*), elk (*Cervis canadensis*), mule deer (*Odocoileus hemionus*), and pronghorn (*Antilocapra americana*); (2) furbearers and small game species: the American badger (*Taxidea taxus*), black-tailed jackrabbit (*Lepus californicus*), bobcat (*Lynx rufus*), coyote (*Canis latrans*, common), desert cottontail (*Sylvilagus audubonii*), gray fox (*Urocyon cinereoargenteus*), kit fox (*Vulpes macrotis*), and red fox (*Vulpes vulpes*); and (3) small nongame species: Botta's pocket gopher (*Thomomys bottae*), cactus mouse (*Peromyscus eremicus*), canyon mouse (*P. crinitis*), deer mouse (*P. maniculatus*), desert shrew (*Notiosorex crawfordi*), desert woodrat (*Neotoma lepida*), little pocket mouse (*Perognathus longimembris*), long-tailed pocket mouse (*Chaetodipus formosus*), Merriam's pocket mouse (*Dipodomys merriami*), northern grasshopper mouse (*Onychomys leucogaster*), southern grasshopper mouse (*O. torridus*), western harvest mouse (*Reithrodontomys megalotis*), and white-tailed antelope squirrel (*Ammospermophilus leucurus*). Bat species that may occur within the area of the SEZ include the big brown bat (*Eptesicus fuscus*), Brazilian free-tailed bat (*Tadarida brasiliensis*), California myotis (*Myotis californicus*), hoary bat (*Lasiurus cinereus*), little brown myotis (*M. lucifugus*), long-legged myotis (*M. volans*), silver-haired bat (*Lasionycteris noctivagans*), and western pipistrelle (*Parastrellus hesperus*).

#### *11.7.11.3.2 Impacts*

As presented in the Draft Solar PEIS, solar energy development within the proposed Millers SEZ could affect potentially suitable habitats of mammal species. The analysis presented in the Draft Solar PEIS indicated that development would result in a small overall impact on all representative mammal species analyzed (Table 11.7.11.3-1 in the Draft Solar PEIS). The reduction in the developable area of the Millers SEZ would result in reduced habitat impacts for all representative mammal species; however, resultant impact levels for all the representative mammal species would still be small. This conclusion also applies to mapped year-round pronghorn habitat that occurs within the Millers SEZ.

#### *11.7.11.3.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on mammals are described in Section A.2.2 of Appendix A of this Final Solar PEIS. With the implementation of required programmatic design features, impacts on mammal species will be reduced.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, the following SEZ-specific design features have been identified:

- The fencing around the solar energy development should not block the free movement of mammals, particularly big game species.

- Wash and playa habitats should be avoided. The Ione Wash and a small wetland area in the SEZ have been identified as non-development areas, but other avoidable wash and playa habitats may exist within the SEZ.

If these SEZ-specific design features are implemented in addition to the required programmatic design features, impacts on mammal species would be small. The need for additional SEZ-specific design features will be identified through the process of preparing parcels for competitive offer and subsequent project specific analysis.

### 11.7.11.4 Aquatic Biota

#### *11.7.11.4.1 Affected Environment*

There are no perennial streams or water bodies present in the proposed Millers SEZ. Updates to the Draft Solar PEIS include the following:

- The intermittent/ephemeral Ione Wash, which runs for approximately 3 mi (5 km) through the center of the proposed Millers SEZ, has now been identified as a non-development area.

- Wetlands within the SEZ have been identified as non-development areas.

- The route of a new transmission line described in the Draft Solar PEIS is no longer assumed.

The surface water features in the Millers SEZ have not been surveyed for aquatic biota. As stated in Appendix C of the Supplement to the Draft Solar PEIS, site surveys can be conducted at the project-specific level to characterize the aquatic biota, if present, within the SEZ.

#### *11.7.11.4.2 Impacts*

The types of impacts on aquatic habitats and biota that could occur from the development of utility-scale solar energy facilities are discussed in Section 5.10.3 of the Draft Solar PEIS and this Final Solar PEIS. Aquatic habitats, including wetland areas, present on or near the Millers SEZ could be affected by solar energy development in a number of ways, including (1) direct disturbance, (2) deposition of sediments, (3) changes in water quantity, and (4) degradation of water quality. The impact assessment provided in the Draft Solar PEIS remains valid, with the following update:

- The intermittent/ephemeral Ione Wash and wetlands within the SEZ have been identified as non-development areas; therefore, they would not be directly affected by construction activities. However, as described in the Draft Solar PEIS, streams and wetlands could be affected indirectly by solar development activities within the SEZ.

### *11.7.11.4.3 SEZ-Specific Design Features and Design Feature Effectiveness*

Required programmatic design features that would reduce impacts on aquatic biota are described in Section A.2.2 of Appendix A of this Final Solar PEIS. SEZ-specific resources and conditions will be considered when programmatic design features are applied, for example:

- Appropriate engineering controls shall be implemented to minimize the amount of contaminants and sediment entering Ione Wash and the wetlands within the SEZ.

- Development shall avoid any additional wetlands identified during future site-specific fieldwork.

It is anticipated that implementation of these programmatic design features will reduce impacts on aquatic biota, and if the utilization of water from groundwater or surface water sources is adequately controlled to maintain sufficient water levels in nearby aquatic habitats, the potential impacts on aquatic biota from solar energy development at the Millers SEZ would be small.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features for aquatic biota have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.7.12 Special Status Species

### 11.7.12.1 Affected Environment

As presented in the Draft Solar PEIS, 19 special status species were identified that could occur or have potentially suitable habitat within the affected area of the proposed Millers SEZ. Since publication of the Draft Solar PEIS, 11 additional special status species have been identified that could potentially occur in the affected area based on county-level occurrences and the presence of potentially suitable habitat. These 11 special status species are all designated sensitive species by the Nevada BLM office and include (1) plants: Tecopa bird's beak (*Cordylanthus tecopensis*); (2) invertebrates: Wong's pyrg (*Pyrgulopsis wongi*); and (3) birds: golden eagle, loggerhead shrike, and long-eared owl; and (4) mammals: big brown bat, Brazilian free-tailed bat, California myotis, hoary bat, long-legged myotis, and silver-haired bat. These additional species are discussed below.

**Tecopa Bird's Beak.** The Tecopa bird's beak is a plant species in the figwort family that is designated as sensitive by the Nevada BLM. This species was not analyzed for the Millers SEZ in the Draft Solar PEIS. This species is known from Esmeralda and Nye Counties in Nevada, as well as Inyo County, California. It inhabits open, moist alkali-crusted clay soils of deep springs seeps and outflow drainages at elevations between 2,100 and 4,900 ft (640 and 1,494 m). Other potentially suitable habitat types include mesic meadows and playa margins. On the basis of SWReGAP land cover types, potentially suitable playa habitat may occur on the SEZ and throughout portions of the area of indirect effects (Table 11.7.12.1-1).

**Wong's Pyrg.** The Wong's pyrg is a freshwater springsnail that is known from the Owens River drainage and the Deep Springs, Fish Lake, and Huntoon Valleys in Inyo County, California, as well as Mineral County, Nevada (Hershler 1994). Although potentially suitable habitat for this species does not occur on the SEZ, this species is known to occur in aquatic habitats in Mineral County, Nevada, approximately 48 mi (77 km) southwest of the SEZ. Although none of these species occur within 5 mi (8 km) of the SEZ, their habitats could be affected by groundwater withdrawals to serve solar energy development on the SEZ.

**Golden Eagle.** The golden eagle is an uncommon to common permanent resident in southern Nevada. This species was not analyzed for the Millers SEZ in the Draft Solar PEIS. The species inhabits rolling foothills, mountain areas, and desert shrublands. It nests on cliff faces and in large trees in open areas. Potentially suitable foraging habitat for this species may occur in the SEZ and throughout the area of indirect effects (Table 11.7.12.1-1). On the basis of an evaluation of SWReGAP land cover types, there is no suitable nesting habitat within the area of direct effects, but about 720 acres (3 $km^2$) of cliff and rock outcrop habitat that may be potentially suitable nesting habitat occurs in the area of indirect effects.

**Loggerhead Shrike.** The loggerhead shrike is a common winter resident in lowlands and foothills of southern Nevada. This species was not analyzed for the Millers SEZ in the Draft Solar PEIS. The species occurs in open habitats with shrubs, trees, utility lines, or other perches. The highest densities of this species occur in open-canopied foothill forests. On the basis of an evaluation of the SWReGAP habitat suitability model for this species, potentially suitable foraging habitat for the loggerhead shrike may occur on the SEZ and throughout the area of indirect effects (Table 11.7.12.1-1).

**Long-Eared Owl.** The long-eared owl is an uncommon year-round resident in southern Nevada. This species was not analyzed for the Millers SEZ in the Draft Solar PEIS. The species inhabits desert shrubland environments in proximity to riparian areas such as desert washes. It nests in trees using old nests from other birds or squirrels. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.7.12.1-1). On the basis of an evaluation of SWReGAP land cover types, no suitable nesting habitat occurs within the SEZ, but about 54 acres (0.2 $km^2$) of pinyon-juniper woodlands that may be potentially suitable nesting habitat occurs in the area of indirect effects.

**TABLE 11.7.12.1-1 Habitats, Potential Impacts, and Potential Mitigation for Special Status Species That Could Be Affected by Solar Energy Development on the Proposed Millers SEZ as Revised[a]**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Maximum Area of Potential Habitat Affected[d]: Outside SEZ (Indirect Effects)[f] | Overall Impact Magnitude[g] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Plants*** | | | | | | |
| Tecopa bird's beak | Cordylanthus tecopensis | BLM-S; FWS-SC; NV-S2 | Known from Esmeralda and Nye Counties, Nevada, as well as Inyo County, California. Inhabits open, moist alkali-crusted clay soils of deep springs, seeps, and outflow drainages. About 97,000 acres[i] of potentially suitable habitat occurs within the SEZ region. | 1,000 acres of potentially suitable habitat lost (1.0% of available potentially suitable habitat) | 6,600 acres of potentially suitable habitat (6.8% of available potentially suitable habitat) | Moderate overall impact. Habitats on the SEZ may be directly affected by construction and operations. Habitats on the SEZ and in the area of indirect effects may also be affected by groundwater withdrawal. The impact of water withdrawal on the regional groundwater system that supports aquatic and mesic habitat in the SEZ region would depend on the volume of water withdrawn to support construction and operations. Avoiding or limiting withdrawals from this regional groundwater system could reduce impacts on this species to small or negligible levels. Note that these potential impact magnitudes and potential mitigation measures also apply to all groundwater-dependent special status species that may occur in the SEZ region. |

**TABLE 11.7.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Maximum Area of Potential Habitat Affected[d]: Outside SEZ (Indirect Effects)[f] | Overall Impact Magnitude[f] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Invertebrates*** | | | | | | |
| Wong's pyrg | *Pyrgulopsis wongi* | BLM-S; NV-S1 | Known from Mineral County, Nevada and Inyo County, California. Occurs in aquatic habitats in the Owens River drainage and the Deep Springs, Fish Lake, and Huntoon Valleys. Nearest recorded occurrences are from Mineral County, approximately 48 mi[j] southwest of the SEZ. The amount of suitable habitat in the SEZ region has not been determined. | 0 acres | 0 acres within the 5-mi area surrounding the SEZ, but suitable habitat elsewhere in the SEZ region could be affected by groundwater withdrawals. | Small to large overall impact. Habitats may be affected by groundwater withdrawal. See Topeca bird's beak for potential impacts and mitigation measures applicable to all groundwater-dependent special status species. |
| ***Birds*** | | | | | | |
| Golden eagle | *Aquila chrysaetos* | BLM-S | An uncommon to common permanent resident and migrant in southern Nevada. Habitat includes rolling foothills, mountain areas, and desert shrublands. Nests on cliff faces and in large trees in open areas. About 4,850,000 acres of potentially suitable habitat occurs within the SEZ region. | 15,000 acres of potentially suitable habitat lost (0.3% of available potentially suitable habitat) | 120,100 acres of potentially suitable habitat (2.5% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| Loggerhead shrike | *Lanius ludovicianus* | BLM-S | A common winter resident in lowlands and foothills in southern Nevada. Prefers open habitats with shrubs, trees, utility lines, or other perches. Highest density occurs in open-canopied foothill forests. About 4,800,000 acres of potentially suitable habitat occurs within the SEZ region. | 15,000 acres of potentially suitable habitat lost (0.3% of available potentially suitable habitat) | 120,000 acres of potentially suitable habitat (2.5% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |

**TABLE 11.7.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Maximum Area of Potential Habitat Affected[d]: Outside SEZ (Indirect Effects)[f] | Overall Impact Magnitude[f] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Birds (Cont.)*** | | | | | | |
| Long-eared owl | *Asio otus* | BLM-S | An uncommon yearlong resident in southern Nevada. Occurs in desert shrubland environments in proximity to riparian areas such as desert washes. Nests in trees using old nests from other birds or squirrels. About 4,800,000 acres of potentially suitable habitat occurs within the SEZ region. | 15,000 acres of potentially suitable habitat lost (0.3% of available potentially suitable habitat) | 119,600 acres of potentially suitable habitat (2.5% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| ***Mammals*** | | | | | | |
| Big brown bat | *Eptesicus fuscus* | BLM-S | Occurs throughout the southwestern United States in various habitat types. Uncommon in hot desert environments, but may occur in areas in close proximity to water sources such as lakes and washes. Roosts in buildings, caves, mines, and trees. About 3,700,000 acres of potentially suitable habitat occurs within the SEZ region. | 16,400 acres of potentially suitable habitat lost (0.4% of available potentially suitable habitat) | 121,300 acres of potentially suitable habitat (2.7% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| Brazilian free-tailed bat | *Tadarida brasiliensis* | BLM-S | A fairly common year-round resident in southern Nevada. Occurs in a variety of habitats including woodlands, shrublands, and grasslands. Roosts in caves, crevices, and buildings. About 4,250,000 acres of potentially suitable habitat occurs within the SEZ region. | 16,400 acres of potentially suitable habitat lost (0.4% of available potentially suitable habitat) | 122,000 acres of potentially suitable habitat (2.9% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |

**TABLE 11.7.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Maximum Area of Potential Habitat Affected[d]: Outside SEZ (Indirect Effects)[f] | Overall Impact Magnitude[f] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Mammals (Cont.)*** | | | | | | |
| California myotis | *Myotis californicus* | BLM-S | A common year-round resident in southern Nevada. Occurs in a variety of habitats including desert, chaparral, woodlands, and forests. Roosts primarily in crevices, but will also us buildings, mines, and hollow trees. About 3,500,000 acres of potentially suitable habitat occurs within the SEZ region. | 16,400 acres of potentially suitable habitat lost (0.5% of available potentially suitable habitat) | 121,100 acres of potentially suitable habitat (3.5% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| Hoary bat | *Lasiurus cinereus* | BLM-S | The most widespread North American bat species, occurs throughout southern Nevada in various habitat types. Occurs in habitats such as woodlands, foothills, desert shrublands, and chaparral. Roosts primarily in trees. About 1,100,000 acres of potentially suitable habitat occurs within the SEZ region. | 4,700 acres of potentially suitable habitat lost (0.4% of available potentially suitable habitat) | 27,300 acres of potentially suitable habitat (2.5% of available suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |

**TABLE 11.7.12.1-1 (Cont.)**

| Common Name | Scientific Name | Listing Status[b] | Habitat[c] | Maximum Area of Potential Habitat Affected[d]: Within SEZ (Direct Effects)[e] | Maximum Area of Potential Habitat Affected[d]: Outside SEZ (Indirect Effects)[f] | Overall Impact Magnitude[f] and Species-Specific Mitigation[h] |
|---|---|---|---|---|---|---|
| ***Mammals (Cont.)*** | | | | | | |
| Long-legged myotis | *Myotis volans* | BLM-S | Common to uncommon year-round resident in southern Nevada. Uncommon in desert and arid grassland environments. Most common in woodlands above 4,000 ft elevation. Forages in chaparral, scrub, woodlands, and desert shrublands. Roosts in trees, caves, and crevices. About 3,700,000 acres of potentially suitable habitat occurs within the SEZ region. | 16,400 acres of potentially suitable habitat lost (0.4% of available potentially suitable habitat) | 121,200 acres of potentially suitable habitat (3.3% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |
| Silver-haired bat | *Lasionycteris noctivagans* | BLM-S | Uncommon year-round resident in desert habitats of southern Nevada. Forages in coniferous forests, foothill woodlands, and montane riparian habitats. May also forage in desert shrublands. Primarily roosts in hollow trees. About 4,150,000 acres of potentially suitable habitat occurs within the SEZ region. | 13,300 acres of potentially suitable habitat lost (0.3% of available potentially suitable habitat) | 103,000 acres of potentially suitable habitat (2.5% of available potentially suitable habitat) | Small overall impact. Direct impact on foraging habitat only. Avoidance of direct impacts on all foraging habitat is not feasible because suitable foraging habitat is widespread in the area of direct effects. |

[a] The species presented in this table represent new species identified following publication of the Draft Solar PEIS or a re-evaluation of those species that were determined to have moderate or large impacts in the Draft Solar PEIS. The other special status species for this SEZ are identified in Table 11.7.12.1-1 of the Draft Solar PEIS.

[b] BLM-S = listed as sensitive by the BLM.

**Footnotes continued on next page.**

**TABLE 11.7.12.1-1 (Cont.)**

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[c] Potentially suitable habitat was determined by using SWReGAP habitat suitability models (USGS 2004, 2007). Area of potentially suitable habitat for each species is presented for the SEZ region, which is defined as the area within 50 mi (80 km) of the SEZ center.

[d] Maximum area of potentially suitable habitat that could be affected relative to availability within the SEZ region. Habitat availability for each species within the region was determined by using SWReGAP habitat suitability models (USGS 2004, 2007). This approach probably overestimates the amount of suitable habitat in the project area.

[e] Direct effects within the SEZ consist of the ground-disturbing activities associated with construction and the maintenance of an altered environment associated with operations.

[f] Area of indirect effects was assumed to be the area adjacent to the SEZ within 5 mi (8 km) of the SEZ boundary where ground-disturbing activities would not occur. Indirect effects include effects from surface runoff, dust, noise, lighting, and so on from project developments. The potential degree of indirect effects would decrease with increasing distance away from the SEZ.

[g] Overall impact magnitude categories were based on professional judgment and are as follows: (1) *small*: ≤1% of the population or its habitat would be lost and the activity would not result in a measurable change in carrying capacity or population size in the affected area; (2) *moderate*: >1 but ≤10% of the population or its habitat would be lost and the activity would result in a measurable but moderate (not destabilizing) change in carrying capacity or population size in the affected area; (3) *large*: >10% of a population or its habitat would be lost and the activity would result in a large, measurable, and destabilizing change in carrying capacity or population size in the affected area. Note that much greater weight was given to the magnitude of direct effects because those effects would be difficult to mitigate. Design features would reduce most indirect effects to negligible levels.

[h] Species-specific mitigations are suggested here, but final mitigations should be developed in consultation with state and federal agencies and should be based on pre-disturbance surveys.

[i] To convert acres to km$^2$, multiply by 0.004047.

[j] To convert mi to km, multiply by 1.6093.

**Big Brown Bat.** The big brown bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Millers SEZ in the Draft Solar PEIS. The big brown bat is uncommon in desert habitats but may occur in desert shrublands in close proximity to water sources. The species inhabits desert shrubland environments in proximity to riparian areas such as desert washes. It roosts in buildings, caves, mines, and trees. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.7.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur on the SEZ. However, approximately 54 acres (0.2 $km^2$) of woodland habitat (pinyon-juniper) and 720 acres (3 $km^2$) of cliff and rock outcrop habitat that may be potentially suitable roosting habitat occur in the area of indirect effects.

**Brazilian Free-Tailed Bat.** The Brazilian free-tailed bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Millers SEZ in the Draft Solar PEIS. The species inhabits woodlands, shrublands, and grasslands. It roosts in caves and crevices. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.7.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur on the SEZ. However, approximately 720 acres (3 $km^2$) of cliff and rock outcrop habitat that may be potentially suitable roosting habitat occurs in the area of indirect effects.

**California Myotis.** The California myotis is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Millers SEZ in the Draft Solar PEIS. The species inhabits desert, chaparral, woodlands, and forests. It roosts primarily in crevices but will also use buildings, mines, and hollow trees. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.7.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur on the SEZ. However, approximately 54 acres (0.2 $km^2$) of woodland habitat (pinyon-juniper) and 720 acres (3 $km^2$) of cliff and rock outcrop habitat that may be potentially suitable roosting habitat occur in the area of indirect effects.

**Hoary Bat.** The hoary bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Millers SEZ in the Draft Solar PEIS. The species inhabits woodlands, foothills, desert shrublands, and chaparral. It roosts primarily in trees. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.7.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests) does not occur on the SEZ (Table 11.7.12.1-1). However, approximately 54 acres (0.2 $km^2$) of woodland habitat (pinyon-juniper) that may be potentially suitable roosting habitat occurs in the area of indirect effects.

**Long-Legged Myotis.** The long-legged myotis is a common to uncommon year-round resident in southern Nevada. This species was not analyzed for the Millers SEZ in the Draft

Solar PEIS. This species is uncommon in desert and arid grassland environments and most common in woodlands above 4,000 ft (1,291 m) elevation. It forages in chaparral, scrub, woodlands, and desert shrublands and roosts in trees, caves, and crevices. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.7.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur on the SEZ. However, approximately 54 acres (0.2 $km^2$) of woodland habitat (pinyon-juniper) and 720 acres (3 $km^2$) of cliff and rock outcrop habitat that may be potentially suitable roosting habitat occur in the area of indirect effects.

**Silver-Haired Bat.** The silver-haired bat is an uncommon year-round resident in southern Nevada. This species was not analyzed for the Millers SEZ in the Draft Solar PEIS. The species inhabits coniferous forests, foothill woodlands, and montane riparian habitats. It may also forage in desert shrublands. This species primarily roosts in hollow trees. Potentially suitable foraging habitat for this species may occur on the SEZ and throughout the area of indirect effects (Table 11.7.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests) does not occur on the SEZ (Table 11.7.12.1-1). However, approximately 54 acres (0.2 $km^2$) of woodland habitat (pinyon-juniper) that may be potentially suitable roosting habitat occurs in the area of indirect effects.

### 11.7.12.2 Impacts

Overall impact magnitude categories were based on professional judgment and include (1) *small*: a relatively small proportion (≤1%) of the special status species' habitat within the SEZ region would be lost; (2) *moderate*: an intermediate proportion (>1 but ≤10%) of the special status species' habitat would be lost; and (3) *large*: >10% of the special status species' habitat would be lost.

As presented in the Draft Solar PEIS, solar energy development within the Millers SEZ could affect potentially suitable habitats of special status species. The analysis presented in the Draft Solar PEIS for the Millers SEZ indicated that development would result in no impact or a small overall impact on all special status species. Development within the Millers SEZ could still affect the same 19 species evaluated in the Draft Solar PEIS; however, the reduction in the developable area would result in reduced (and still small) impact levels compared to original estimates in the Draft Solar PEIS.

In addition, impacts on the 11 BLM-designated sensitive species that were not evaluated for the Millers SEZ in the Draft Solar PEIS are discussed below and in Table 11.7.12.1-1. The impact assessment for these additional species was carried out in the same way as for those species analyzed in the Draft Solar PEIS (Section 11.7.12.2 of the Draft Solar PEIS).

**Tecopa Bird's Beak.** The Tecopa bird's beak was not analyzed for the Millers SEZ in the Draft Solar PEIS. This species is known from Esmeralda and Nye Counties in Nevada, as well as Inyo County, California. It inhabits open, moist alkali-crusted clay soils of deep springs, seeps, and outflow drainages at elevations between 2,100 and 4,900 ft (640 and 1,494 m). Other potentially suitable habitat types include mesic meadows and playa margins. On the basis of SWReGAP land cover types, approximately 1,000 acres (4 $km^2$) of potentially suitable habitat on the revised area of the Millers SEZ could be directly affected by construction and operations (Table 11.7.12.1-1). This direct effects area represents 1.0% of potentially suitable habitat in the SEZ region. About 6,600 acres (27 $km^2$) of potentially suitable habitat occurs in the area of indirect effects; this area represents about 6.8% of the available suitable foraging habitat in the SEZ region (Table 11.7.12.1-1). Most of this suitable habitat is represented by playa habitat.

The overall impact on the Tecopa bird's beak from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised area of the Millers SEZ is considered moderate, because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents greater than 1% but less than 10% of potentially suitable foraging habitat in the SEZ region. Groundwater withdrawals to support solar energy development on the SEZ may affect habitat for the Tecopa bird's beak on the SEZ and throughout the area of indirect effects. Impacts of groundwater depletion from solar energy development in the revised area of the Millers SEZ cannot be quantified without identification of the cumulative amount of groundwater withdrawals needed to support development on the SEZ. Consequently, the overall impact on this species would depend in part on the solar energy technology deployed, the scale of development within the SEZ, the type of cooling system used, and the degree of influence of water withdrawals in the SEZ on drawdown and surface water discharges in habitats supporting this species (Table 11.7.12.1-1).

The implementation of design features and complete avoidance or limitations of groundwater withdrawals from the regional groundwater system would reduce impacts on the Tecopa bird's beak and other groundwater-dependent species to small or negligible levels. Impacts can be better quantified for specific projects once water needs are identified and through application of a regional groundwater model.

**Wong's Pyrg.** The Wong's pyrg is a freshwater springsnail that is known from the Owens River drainage and the Deep Springs, Fish Lake, and Huntoon Valleys in Inyo County, California, as well as Mineral County, Nevada (Hershler 1994). Although potentially suitable habitat for this species does not occur on the SEZ, this species is known to occur in aquatic habitats in Mineral County, Nevada, approximately 48 mi (77 km) southwest of the SEZ. Groundwater withdrawn from the regional groundwater basin to serve construction and operations of solar energy facilities on the SEZ could affect aquatic and riparian habitats for this species. Such impacts would result from the lowering of the water table and alteration of hydrologic processes.

Impacts of groundwater depletion from solar energy development in the revised area of the Millers SEZ cannot be quantified without identification of the cumulative amount of groundwater withdrawals needed to support development on the SEZ. Consequently, the overall impact on the Wong's pyrg could range from small to large and would depend in part on the solar energy technology deployed, the scale of development within the SEZ, the type of cooling system used, and the degree of influence of water withdrawals in the SEZ on drawdown and surface water discharges in habitats supporting these species (Table 11.7.12.1-1).

The implementation of design features and complete avoidance or limitations of groundwater withdrawals from the regional groundwater system would reduce impacts on the Wong's pyrg and other groundwater-dependent species to small or negligible levels. Impacts can be better quantified for specific projects once water needs are identified and through application of a regional groundwater model.

**Golden Eagle.** The golden eagle was not analyzed for the Millers SEZ in the Draft Solar PEIS. This species is an uncommon to common permanent resident in southern Nevada, and potentially suitable foraging habitat is expected to occur in the affected area of the Millers SEZ. Approximately 15,000 acres (61 $km^2$) of potentially suitable foraging habitat on the SEZ could be directly affected by construction and operations (Table 11.7.12.1-1). This direct effects area represents 0.3% of potentially suitable habitat in the SEZ region. About 120,100 acres (486 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.5% of the available suitable foraging habitat in the SEZ region (Table 11.7.12.1-1). Most of this area could serve as foraging habitat (open shrublands). On the basis of an evaluation of SWReGAP land cover types, there is no suitable nesting habitat within the area of direct effects. However, about 720 acres (3 $km^2$) of cliff and rock outcrop habitat that may be potentially suitable nesting habitat occurs in the area of indirect effects.

The overall impact on the golden eagle from construction, operation, and decommissioning of utility-scale solar energy facilities within the Millers SEZ is considered small, because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents less than 1% of potentially suitable foraging habitat in the SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of direct impacts on all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the golden eagle, because potentially suitable shrubland is widespread throughout the area of direct effects and readily available in other portions of the affected area.

**Loggerhead Shrike.** The loggerhead shrike was not analyzed for the Millers SEZ in the Draft Solar PEIS. This species is a common winter resident in lowlands and foothills of southern Nevada. Approximately 15,000 acres (61 $km^2$) of potentially suitable foraging habitat on the SEZ could be directly affected by construction and operations (Table 11.7.12.1-1). This direct effects area represents 0.3% of potentially suitable habitat in the SEZ region. About 120,000 acres (486 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.5% of the available suitable foraging habitat in the SEZ region (Table 11.7.12.1-1).

The overall impact on the loggerhead shrike from construction, operation, and decommissioning of utility-scale solar energy facilities within the Millers SEZ is considered small, because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents less than 1% of potentially suitable foraging habitat in the SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of direct impacts on all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the loggerhead shrike, because potentially suitable shrubland is widespread throughout the area of direct effects and is readily available in other portions of the affected area.

**Long-Eared Owl.** The long-eared owl was not analyzed for the Millers SEZ in the Draft Solar PEIS. This species is an uncommon to common permanent resident in southern Nevada and potentially suitable foraging habitat is expected to occur in the affected area of the Millers SEZ. Approximately 15,000 acres (61 km$^2$) of potentially suitable foraging habitat on the SEZ could be directly affected by construction and operations (Table 11.7.12.1-1). This direct effects area represents 0.3% of potentially suitable habitat in the SEZ region. About 119,600 acres (484 km$^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.5% of the available suitable foraging habitat in the SEZ region (Table 11.7.12.1-1).

The overall impact on the long-eared owl from construction, operation, and decommissioning of utility-scale solar energy facilities within the Millers SEZ is considered small, because the amount of potentially suitable foraging habitat for this species in the area of direct effects represents less than 1% of potentially suitable foraging habitat in the SEZ region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of direct impacts on all potentially suitable foraging habitat is not a feasible way to mitigate impacts on the long-eared owl, because potentially suitable shrubland is widespread throughout the area of direct effects and is readily available in other portions of the affected area.

**Big Brown Bat.** The big brown bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Millers SEZ in the Draft Solar PEIS. Suitable roosting habitats (caves, forests, and buildings) are not expected to occur on the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 16,400 acres (66 km$^2$) of potentially suitable foraging habitat on the SEZ could be directly affected by construction and operations (Table 11.7.12.1-1). This direct effects area represents about 0.4% of potentially suitable foraging habitat in the region. About 121,300 acres (491 km$^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.7% of the available suitable foraging habitat in the region (Table 11.7.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur on the SEZ. However, approximately 54 acres (0.2 km$^2$) of woodland habitat (pinyon-juniper) and 720 acres (3 km$^2$) of cliff and rock outcrop habitat that may be potentially suitable roosting habitat occurs in the area of indirect effects.

The overall impact on the big brown bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the Millers SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

**Brazilian Free-Tailed Bat.** The Brazilian free-tailed bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Millers SEZ in the Draft Solar PEIS. Suitable roosting habitats (caves, forests, and buildings) are not expected to occur on the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 16,400 acres (66 $km^2$) of potentially suitable foraging habitat on the revised SEZ could be directly affected by construction and operations (Table 11.7.12.1-1). This direct effects area represents about 0.4% of potentially suitable foraging habitat in the region. About 122,000 acres (494 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.9% of the available suitable foraging habitat in the region (Table 11.7.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur on the SEZ. However, approximately 54 acres (0.2 $km^2$) of woodland habitat (pinyon-juniper) and 720 acres (3 $km^2$) of cliff and rock outcrop habitat that may be potentially suitable roosting habitat occur in the area of indirect effects.

The overall impact on the Brazilian free-tailed bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Millers SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

**California Myotis.** The California myotis is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Millers SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests and rock outcrops) are not expected to occur on the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 16,400 acres (66 $km^2$) of potentially suitable foraging habitat on the SEZ could be directly affected by construction and operations (Table 11.7.12.1-1). This direct effects area represents about 0.5% of potentially suitable foraging habitat in the region. About 121,100 acres (490 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 3.5% of the available suitable foraging habitat in the region (Table 11.7.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur on the SEZ. However, approximately 54 acres (0.2 $km^2$) of woodland habitat (pinyon-juniper) and 720 acres (3 $km^2$) of cliff and rock outcrop habitat that may be potentially suitable roosting habitat occur in the area of indirect effects.

The overall impact on the California myotis from construction, operation, and decommissioning of utility-scale solar energy facilities within the Millers SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

**Hoary Bat.** The hoary bat is a fairly common year-round resident in southern Nevada. This species was not analyzed for the Millers SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests) are not expected to occur on the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 4,700 acres (19 km$^2$) of potentially suitable foraging habitat on the SEZ could be directly affected by construction and operations (Table 11.7.12.1-1). This direct effects area represents 0.4% of potentially suitable foraging habitat in the region. About 27,300 acres (110 km$^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.5% of the available suitable foraging habitat in the region (Table 11.7.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat does not occur on the SEZ. However, approximately 54 acres (0.2 km$^2$) of woodland habitat (pinyon-juniper) that may be potentially suitable roosting habitat occurs in the area of indirect effects.

The overall impact on the hoary bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the Millers SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

**Long-Legged Myotis.** The long-legged myotis is a common to uncommon year-round resident in southern Nevada. This species was not analyzed for the Millers SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests and rock outcrops) are not expected to occur on the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 16,400 acres (66 km$^2$) of potentially suitable foraging habitat on the SEZ could be directly affected by construction and operations (Table 11.7.12.1-1). This direct effects area represents about 0.4% of potentially suitable foraging habitat in the region. About 121,200 acres (490 km$^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 3.3% of the available suitable foraging habitat in the region (Table 11.7.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat (forests and rock outcrops) does not occur on the SEZ. However, approximately 54 acres (0.2 km$^2$) of woodland habitat (pinyon-juniper) and 720 acres (3 km$^2$) of cliff and rock outcrop habitat that may be potentially suitable roosting habitat occur in the area of indirect effects.

The overall impact on the long-legged myotis from construction, operation, and decommissioning of utility-scale solar energy facilities within the Millers SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

**Silver-Haired Bat.** The silver-haired bat is an uncommon year-round resident in southern Nevada. This species was not analyzed for the Millers SEZ in the Draft Solar PEIS. Suitable roosting habitats (forests) are not expected to occur on the SEZ, but the availability of suitable roosting sites in the area of indirect effects has not been determined. Approximately 13,300 acres (54 $km^2$) of potentially suitable foraging habitat on the revised SEZ could be directly affected by construction and operations (Table 11.7.12.1-1). This direct effects area represents about 0.3% of potentially suitable foraging habitat in the region. About 103,000 acres (417 $km^2$) of potentially suitable foraging habitat occurs in the area of indirect effects; this area represents about 2.5% of the available suitable foraging habitat in the region (Table 11.7.12.1-1). On the basis of an evaluation of SWReGAP land cover types, potentially suitable roosting habitat does not occur on the SEZ. However, approximately 54 acres (0.2 $km^2$) of woodland habitat (pinyon-juniper) that may be potentially suitable roosting habitat occurs in the area of indirect effects.

The overall impact on the silver-haired bat from construction, operation, and decommissioning of utility-scale solar energy facilities within the revised Millers SEZ is considered small, because the amount of potentially suitable habitat for this species in the area of direct effects represents less than 1% of potentially suitable habitat in the region. The implementation of programmatic design features is expected to be sufficient to reduce indirect impacts on this species to negligible levels. Avoidance of all potentially suitable foraging habitat is not a feasible way to mitigate impacts, because potentially suitable foraging habitat is widespread throughout the area of direct effects and is readily available in other portions of the SEZ region.

#### 11.7.12.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features are described in Section A.2.2 of Appendix A of the Draft Solar PEIS. SEZ-specific resources and conditions will determine how programmatic design features are applied, for example:

- Pre-disturbance surveys shall be conducted within the SEZ to determine the presence and abundance of special status species, including those identified in

Table 11.7.12.1-1 of the Draft Solar PEIS and in Table 11.7.12.1-1 of this update for the Final Solar PEIS. Disturbance to occupied habitats for these species shall be avoided or minimized to the extent practicable. If avoiding or minimizing impacts on occupied habitats is not possible, translocation of individuals from areas of direct effects or compensatory mitigation of direct effects on occupied habitats may be used to reduce impacts. A comprehensive mitigation strategy for special status species that uses one or more of these options to offset the impacts of development should be generated in coordination with the appropriate federal and state agencies.

- Coordination shall be conducted with the USFWS and NDOW for the Crescent Dunes aegialian scarab beetle, Crescent Dunes serican scarab beetle, and greater sage-grouse (*Centrocercus urophasianus*)—species that are candidates or under review for ESA listing. Coordination would identify an appropriate survey protocol, and mitigation requirements, which may include avoidance, minimization, translocation, or compensation.

- Avoiding or limiting groundwater withdrawals from the regional groundwater basin to serve solar energy development on the SEZ will reduce or prevent impacts on the following groundwater-dependent special status species that may occur more than 5 mi (8 km) from the SEZ boundary: Tecopa bird's beak and Wong's pyrg.

It is anticipated that implementation of the programmatic design features will reduce the majority of impacts on the special status species from habitat disturbance and groundwater use.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis. Projects will comply with terms and conditions set forth by the USFWS Biological Opinion resulting from the programmatic consultations and any necessary project-specific ESA 7 consultations.

## 11.7.13 Air Quality and Climate

Except as noted below, the information for air quality and climate presented for the affected environment of the Draft Solar PEIS remains valid.

### 11.7.13.1 Affected Environment

#### *11.7.13.1.1 Existing Air Emissions*

The Draft Solar PEIS presented Esmeralda County emissions data for 2002. More recent data for 2008 (EPA 2011a) were reviewed for this Final Solar PEIS. The two emissions inventories used different sources and assumptions; for example, the 2008 data did not include biogenic emissions. All emissions were lower in the more recent data. These changes would not affect the modeled air quality impacts presented in this update.

#### *11.7.13.1.2 Air Quality*

The calendar quarterly average NAAQS of 1.5 μg/$m^3$ for lead (Pb) presented in Table 11.7.13.1-2 of the Draft Solar PEIS has been replaced by the rolling 3-month standard (0.15 μg/$m^3$). The federal 24-hour and annual $SO_2$ and 1-hour $O_3$ standards have been revoked as well (EPA 2011b). These changes will not affect the modeled air quality impacts presented in this update. Nevada State Ambient Air Quality Standards (SAAQS) have not been changed.

### 11.7.13.2 Impacts

#### *11.7.13.2.1 Construction*

**Methods and Assumptions**

Except as noted below, the methods and modeling assumptions are the same as those presented in the Draft Solar PEIS. The developable area of the proposed Millers SEZ was reduced by about 2% from 16,787 acres (67.9 $km^2$) to 16,534 acres (66.9 $km^2$). Given this small change, remodeling was not warranted, and the modeled air quality impacts and conclusions presented in the Draft Solar PEIS (as summarized below) remain valid.[1]

**Results**

Predicted 24-hour and annual $PM_{10}$ and 24-hour $PM_{2.5}$ concentration levels could exceed the standard levels at the SEZ boundaries and in the immediate surrounding areas during the construction of solar facilities. To reduce potential impacts on ambient air quality and in compliance with programmatic design features, aggressive dust control measures would be used. Potential particulate air quality impacts on nearby communities would not exceed standard levels. Impacts from construction activities are not anticipated to exceed Class I PSD $PM_{10}$ increments at the nearest federal Class I area (John Muir WA in California). Construction activities are not subject to the PSD program, and the comparison provides only a screen for

[1] At this programmatic level, detailed information on construction activities, such as facility size, type of solar technology, heavy equipment fleet, activity level, work schedule, and so forth, is not known; thus air quality modeling cannot be conducted. Therefore, it has been assumed that an area of 6,000 acres (24.28 $km^2$) in total would be disturbed continuously; the modeling results and discussion here should be interpreted in that context. During the site-specific project phase, more detailed information would be available and more realistic air quality modeling analysis could be conducted. It is likely that impacts on ambient air quality predicted for specific projects would be much lower than those in this Final Solar PEIS.

gauging the magnitude of the impact. Accordingly, it is anticipated that impacts of construction activities on ambient air quality would be moderate and temporary.

Given the small change in developable area, emissions from construction equipment and vehicles would be almost the same as those identified in the Draft Solar PEIS. Any potential impacts on AQRVs at nearby federal Class I areas would be about the same as those in the Draft Solar PEIS, and the conclusions in the Draft Solar PEIS remain valid. Construction-related emissions are temporary and thus would cause some unavoidable but short-term impacts.

#### *11.7.13.2.2 Operations*

The reduction of about 2% in developable area of the proposed Millers SEZ decreases the generation capacity and annual power generation by a similar percentage and thus potentially avoided emissions presented in the Draft Solar PEIS. Updated estimates for emissions potentially avoided by full solar development of the proposed Millers SEZ can be obtained from the table in the Draft Solar PEIS by reducing the tabulated emissions shown in Table 11.7.13.2-2 of the Draft Solar PEIS by 1.5%. For example, depending on the technology used, up to 3,116 tons/yr of $NO_X$ (= 98.5% × the lower end value of 3,164 tons/yr tabulated in the Draft Solar PEIS) could be avoided by full solar development of the proposed Millers SEZ as revised for this Final Solar PEIS. These tabulated results are consistent with, but slightly smaller than, the results presented in the Draft Solar PEIS. Solar facilities built in the Millers SEZ could be more important than those built in other states in terms of reducing fuel combustion–related emissions.

#### *11.7.13.2.3 Decommissioning and Reclamation*

The discussion in the Draft Solar PEIS remains valid. Decommissioning and reclamation activities would be of short duration, and their potential impacts would be moderate and temporary.

### 11.7.13.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce air quality impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Limiting dust generation during construction and operations is a required programmatic design feature under the BLM Solar Energy Program. These extensive fugitive dust control measures would keep off-site PM levels as low as possible during construction.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features for air quality have been identified for the proposed Millers SEZ. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.7.14 Visual Resources

### 11.7.14.1 Affected Environment

No boundary revisions were identified for the proposed SEZ in the Supplement to the Draft Solar PEIS; however, non-development areas were identified. For the proposed Millers SEZ, 253 acres (1.0 km$^2$) of the Ione Wash and a small wetland area in the southern portion of the SEZ were identified as non-development areas. The remaining developable area within the SEZ is 16,534 acres (66.9 km$^2$).

An updated VRI map for the SEZ and surrounding lands is shown in Figure 11.7.14.1-1; it provides information collected in BLM's 2010 and 2011 VRI, which was finalized in October 2011 (BLM 2011a). As shown, the updated VRI values for the SEZ primarily are VRI Class III, indicating moderate visual values; a small portion in the northeast corner of the SEZ is VRI Class IV, indicating low visual values. The SEZ area received a low scenic quality rating, because it lacks topographic variability, diverse vegetation, water features, and range of colors. The SEZ area's adjacent scenery was rated as a positive scenic quality attribute. The SEZ area received a high sensitivity rating, because of the amount of use, public interest, and adjacent land uses within the U.S. 95 corridor.

On the basis of the 2011 VRI class assignments, lands in the Battle Mountain District Office within the 25-mi (40-km), 650-ft (198-m) viewshed of the SEZ now include 26,184 acres (106.0 km$^2$) of VRI Class II areas, 206,124 acres (834.2 km$^2$) of VRI Class III areas, and 284,059 acres (1,149.5 km$^2$) of VRI Class IV areas.

As indicated in the Draft Solar PEIS, the Tonopah RMP (BLM 1997) indicates that the SEZ and surrounding area are managed as VRM Class IV, which permits major modification of the existing character of the landscape. Since the publication of the Draft Solar PEIS, the Battle Mountain District Office has been preparing a new comprehensive RMP and associated EIS. The RMP/EIS will replace the existing 1997 Tonopah RMP and 1986 Shoshone-Eureka RMP. The RMP revision process began in December 2010 (BLM 2011b).

### 11.7.14.2 Impacts

The summary of impacts provided in the Draft Solar PEIS remains valid, as follows. Development within the SEZ could create a visually complex landscape that would contrast strongly with the strongly horizontal landscape of the flat valley in which the SEZ is located. Large visual impacts on the SEZ and surrounding lands within the SEZ viewshed would be associated with solar energy development because of major modification of the character of the existing landscape. The potential exists for additional impacts from construction and operation of transmission lines and access roads within the SEZ.

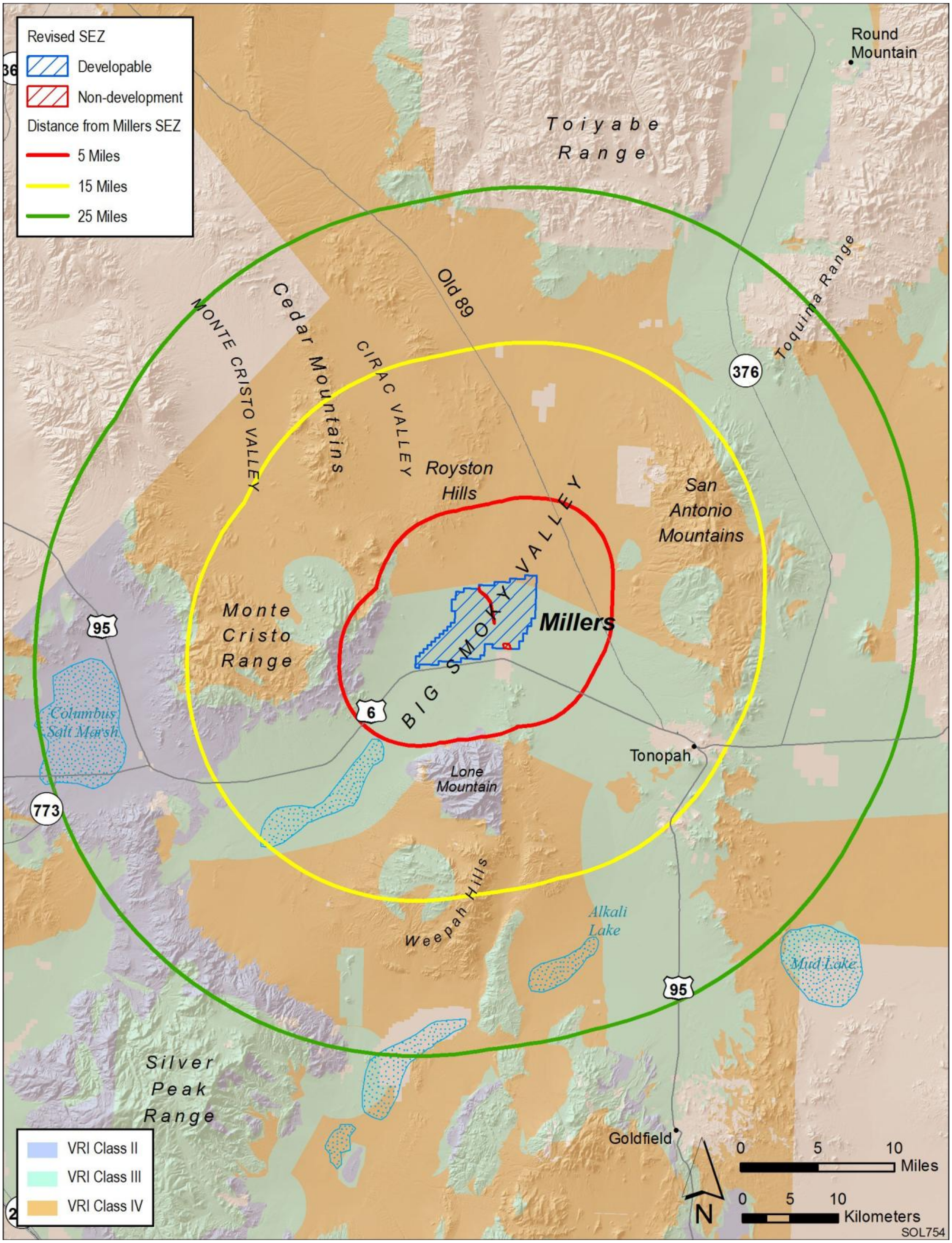


FIGURE 11.7.14.1-1 Visual Resource Inventory Values for the Proposed Millers SEZ as Revised

The SEZ is in an area of low scenic quality. Residents of Tonopah and nearby areas, workers, and visitors to the area may experience visual impacts from solar energy facilities located within the SEZ (as well as from any associated access roads and transmission lines) as they travel area roads. The residents nearest to the SEZ could be subjected to large visual impacts from solar energy development within the SEZ. In addition, U.S. 6 passes very close to the SEZ, and travelers on that road could be subjected to strong visual contrasts from solar development within the SEZ, but typically their exposure would be brief. Utility-scale solar energy development within the proposed Millers SEZ could cause weak levels of visual contrast for some residents of Tonopah, generally for persons in the westernmost parts of the community.

#### 11.7.14.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on visual resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. While application of the programmatic design features would reduce potential visual impacts somewhat, the degree of effectiveness of these design features can only be assessed at the site- and project-specific level. Given the large scale, reflective surfaces, and strong regular geometry of utility-scale solar energy facilities and the lack of screening vegetation and landforms within the SEZ viewshed, siting the facilities away from sensitive visual resource areas and other sensitive viewing areas would be the primary means of mitigating visual impacts. The effectiveness of other visual impact mitigation measures generally would be limited.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features to address impacts on visual resources in the Millers SEZ have been identified in this Final Solar PEIS. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.7.15 Acoustic Environment

#### 11.7.15.1 Affected Environment

The developable area of the proposed Millers SEZ was reduced by about 2% from 16,787 acres (67.9 $km^2$) to 16,534 acres (66.9 $km^2$); the boundaries of the SEZ were not changed, and thus the information for affected environment remains the same as presented in the Draft Solar PEIS.

#### 11.7.15.2 Impacts

##### *11.7.15.2.1 Construction*

Since the boundaries of the proposed Millers SEZ remain unchanged and the reduction of the developable area is small, the noise impacts from solar development in the proposed Millers

SEZ remain the same as presented in the Draft Solar PEIS. Construction within the SEZ would cause negligible unavoidable, but localized, short-term noise impacts on the nearest residences located more than 10 mi (16 km) north and east–southeast of the SEZ. No adverse vibration impacts are anticipated from construction activities, including pile driving for dish engines.

#### *11.7.15.2.2 Operations*

The conclusions presented in the Draft Solar PEIS remain valid. Even if TES were used, operating parabolic trough or power tower facilities would result in minimal adverse noise impacts on the nearest residences. The noise levels would also depend on background noise levels and meteorological conditions.

Potential noise impacts on the nearest residences from operating dish engines would be expected to be minimal with predicted noise levels well below the EPA guideline of 55 dBA $L_{dn}$.

Small changes in the developable area of the proposed SEZ would not affect the discussions of vibration, transformer and switchyard noise, and transmission line corona discharge presented in the Draft Solar PEIS. Noise impacts from these sources would be negligible.

#### *11.7.15.2.3 Decommissioning and Reclamation*

The conclusions presented in the Draft Solar PEIS remain valid. Decommissioning and reclamation activities would be of short duration, and their potential noise impacts would be minimal and temporary.

### 11.7.15.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce noise impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will provide some protection from noise impacts.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features to address noise impacts in the Millers SEZ are required. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.7.16 Paleontological Resources

### 11.7.16.1 Affected Environment

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- The playa deposits in the southern portion of the SEZ are now designated as non-developable areas.

- The BLM Regional Paleontologist may have additional information regarding the paleontological potential of the SEZ and be able to verify the PFYC of the SEZ as Class 2 and 3b as used in the Draft Solar PEIS.

#### 11.7.16.2 Impacts

The assessment provided in the Draft Solar PEIS remains valid. The potential for impacts in most of the SEZ is unknown, but may be potentially high in some areas. A more detailed look at the geological deposits of the SEZ is needed to determine whether a paleontological survey is warranted.

#### 11.7.16.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on paleontological resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Impacts would be minimized through the implementation of required programmatic design features, including a stop-work stipulation in the event that paleontological resources are encountered during construction, as described in Section A.2.2 of Appendix A.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features for paleontological resources have been identified. If the geological deposits for 6% of the SEZ are determined to be consistent with a classification of PFYC Class 2, mitigation of paleontological resources in the alluvial deposits would not likely be necessary. The need for and nature of SEZ-specific design features for 94% of the proposed Millers SEZ would depend on the results of future paleontological investigations. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

As additional information on paleontological resources (e.g., from regional paleontologists or from new surveys) becomes available, the BLM will post the data to the project Web site (http://solareis.anl.gov) for use by applicants, the BLM, and other stakeholders.

### 11.7.17 Cultural Resources

#### 11.7.17.1 Affected Environment

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- A tribally approved ethnographic study of the proposed Millers SEZ and surrounding area was conducted (SWCA and University of Arizona 2011), and a summary of that study was presented in the Supplement to the Draft Solar PEIS. A number of new potential sites, new cultural landscapes, important water sources, and traditional plants and animals were identified as a result of this study (see Section 11.7.18 for a description of the latter). The completed ethnographic study is available in its entirety on the Solar PEIS Web site (http://solareis.anl.gov).

- Water sources important to the Duckwater and Timbisha Shoshone in the Millers SEZ and surrounding area include Pleistocene Lake Tonopah, Peavine Creek, Ione Wash, Cloverdale Creek, and Darrough's Hot Spring.

- Geological features important to the Duckwater and Timbisha Shoshone in the Millers SEZ and surrounding area include the entire Big Smoky Valley, Lone Mountain, the Toiyabe Range, the Toquima Range, the Monte Cristo Range, Weepah Hills, and Royston Hills.

- During a site visit to the proposed Millers SEZ, tribal representatives identified a projectile point and several areas of flaked stone within the SEZ. It is unknown whether these artifacts represented previously recorded sites or whether they were new finds.

- Additional information may be available to characterize the area surrounding the proposed SEZ in the future (after the Final Solar PEIS is completed), as follows:
  - Results of a Class I literature file search to better understand (1) the site distribution pattern in the vicinity of the SEZ, (2) trail networks through existing ethnographic reports, and (3) overall cultural sensitivity of the landscape.
  - Results of a Class II reconnaissance-level stratified random sample survey of 827 acres (3.3 $km^2$) or roughly 5% of the SEZ. The Class II survey is being conducted by the BLM to meet its ongoing Section 110 responsibilities under the NHPA. The objectives of the Class II surveys currently under contract are to reliably predict the density, diversity, and distribution of archaeological sites within each SEZ in Arizona, California, and Nevada and create sensitivity zones based on projected site density, complexity, likely presence of human burials, and/or other tribal concerns. The BLM will continue to request funding to support additional Class II sample inventories in the SEZ areas. Areas of interest, such as dune areas and along washes, as determined through a Class I review, and, if appropriate, subsurface testing of dune and/or colluvium areas should be considered in sampling strategies for future surveys.
  - Continuation of government-to-government consultation as described in Section 2.4.3 of the Supplement to the Draft Solar PEIS and IM 2012-032 (BLM 2011c), including follow-up to recent ethnographic studies covering

some SEZs in Nevada and Utah with tribes not included in the original studies to determine whether those tribes have similar concerns.

#### 11.7.17.2 Impacts

As stated in the Draft Solar PEIS, direct impacts on significant cultural resources could occur in the proposed Millers SEZ; however, further investigation is needed. Impacts on cultural resources are possible in the dune areas associated with Lake Tonopah, as well as areas associated with the Millers town site.

#### 11.7.17.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on cultural resources are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Programmatic design features assume that the necessary surveys, evaluations, and consultations will occur.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, the following SEZ-specific design feature for cultural resources has been identified:

- Areas with a high potential for containing significant cultural resources or with a high density of cultural resources should be avoided. However, because of the high likelihood that the area contains prehistoric sites associated with Lake Tonopah and the presence of historic period sites related to the development of the Millers town site, complete avoidance of NRHP-eligible sites may not be possible. In particular, it may not be possible to fully mitigate the loss of such a large number of sites associated with one Pleistocene lake system.

Additional SEZ-specific design features would be determined in consultation with the Nevada SHPO and affected tribes and would depend on the results of future investigations. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.7.18 Native American Concerns

#### 11.7.18.1 Affected Environment

Data provided in the Draft Solar PEIS remain valid, with the following updates:

- A tribally approved ethnographic study of the proposed Millers SEZ was conducted (SWCA and University of Arizona 2011), and a summary of that study was presented in the Supplement to the Draft Solar PEIS. A number of new potential sites, new cultural landscapes, important water sources, and traditional plants and animals were identified as a result of this study. The completed ethnographic study is available in its entirety on the Solar PEIS Web site (http://solareis.anl.gov).

- The tribal representatives from both the Duckwater and Timbisha Shoshone Tribes believe that all the cultural resources and landscapes within the proposed Millers SEZ are important in helping both tribes to understand their past, present, and future.

- Crescent Dunes has been identified as an important landscape feature, a geological anomaly known as "singing dunes." According to tribal representatives, the Crescent Dunes have a great deal of *Puha* (or power) and their ancestors would gather there for ceremonies.

- Tribal representatives of the Duckwater and Timbisha Shoshone Tribes maintain that the Big Smoky Valley connects the people to the surrounding mountains, valleys, and water sources. Areas of particular importance are the Toiyabe and Toquima Ranges, which are associated with origin stories for staple foods such as pine nuts and fish. Seasonal festivals, called Fandangos, were held in Big Smoky Valley as well.

- Geological features identified by tribal representatives as possessing cultural importance include Lone Mountain, the Monte Cristo Range, Weepah Hills, and Royston Hills.

- Late Pleistocene Lake Tonopah, Ione Wash, Peavine Creek, and Cloverdale Creek were identified as important water sources to the Shoshone.

- The following traditional plants have been identified in addition to those listed in Table 11.7.18.1-2 of the Draft Solar PEIS: bud sagebrush (*Picrothamnus desertorum*), desert prince's plume/Indian spinach (*Stanleya pinnata*), desert trumpet (*Eriogonum inflatum*), Douglas rabbitbrush (*Chrysothamnus viscidiflorus*), dune evening primrose (*Oenothera deltoides*), horsebrush (*Tetradymia* sp.), Mojave seablite (*Suaeda moquinii*), Nevada smokebush (*Psorathamnus polydenius*), orange lichen (*Caloplaca trachyphylla*), rubber rabbitbrush (*Ericameria nauseosa*), shadscale (*Atriplex confertifolia*), silver cholla (*Opuntia echinocarpa*), spiny hopsage (*Grayia spinosa*), spiny menodora (*Menodora spinescens*), Whipple's cholla (*Opuntia whipplei*), and wolfberry (*Lycium* sp.).

- The following traditional animals have been identified in addition to those listed in Table 11.7.18.1-3 of the Draft Solar PEIS: bobcat (*Lynx sp.*), Cougar (*Puma concolor*), mule deer (*Odocoileus hemionus*), pronghorn antelope (*Antilocarpa Americana*), American kestrel (*Falco sparverius*), Gambel's quail (*Callipepla gambelii*), greater roadrunner (*Geococcyx californianus*), horned lark (*Eremophilia alpestris*), killdeer (*Charadrius vociferous*), mourning dove (*Zenaida macroura*), nighthawk (*Chardeiles* sp.), and turkey vulture (*Carhartes aura*).

### 11.7.18.2 Impacts

The following summary of potential concerns provided in the Draft Solar PEIS remains valid. In the past, the Western Shoshone and Owens Valley Paiutes have expressed concern over project impacts on a variety of resources. While no comments specific to the proposed Millers SEZ have been received from Native American tribes to date, in comments on the scope of the Solar PEIS, the Big Pine Paiute Tribe of the Owens Valley has recommended that the BLM preserve undisturbed lands intact and that recently disturbed lands, such as abandoned farm fields, rail yards, mines, and airfields, be given primary consideration for solar energy development. Potential impacts on existing water supplies were also stated to be a primary concern. The construction of utility-scale solar energy facilities within the proposed SEZ would almost certainly result in the destruction of some plants important to Native Americans and the habitat of some traditionally important animals.

In addition to the impacts discussed in the Draft Solar PEIS, the ethnographic study conducted for the proposed Millers SEZ identified the following impacts:

- Development within the proposed Millers SEZ will result in visual impacts on Crescent Dunes and interfere with views of Lone Mountain, the Monte Cristo Range, the Toyiabe Range, and the Toquima Range from the location of the proposed SEZ.

- Development of a project area within the SEZ will directly affect culturally important plant and animal resources, because it will likely require the grading of the project area, removal of vegetation, and the destruction of burrows, nests, and migratory habitat.

- OHV use, nonvehicular recreational activities such as hiking, and cattle ranching have been identified by tribal representatives as current impacts on cultural resources, cultural landscapes, traditionally important plants and animals, and water sources in the SEZ and surrounding area (SWCA and University of Arizona 2011).

### 11.7.18.3 SEZ-Specific Design Features and Design Feature Effectiveness

Tribal representatives believe that solar energy development within the proposed Millers SEZ will adversely affect identified and unidentified archaeological resources, water sources, geological features associated with the Big Smoky Valley, and traditional plant, mineral, and animal resources (SWCA and University of Arizona 2011). Required programmatic design features that would reduce impacts on Native American concerns are described in Section A.2.2 of Appendix A of this Final Solar PEIS. For example, impacts would be minimized through the avoidance of sacred sites, water sources, and tribally important plant and animal species. Programmatic design features require that the necessary surveys, evaluations, and consultations would occur. The tribes would be notified regarding the results of archaeological surveys, and they would be contacted immediately upon the discovery of Native American human remains and associated cultural items.

On the basis of the impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features to address Native American concerns have been identified. The need for and nature of SEZ-specific design features would be determined during government-to-government consultation with the affected tribes as part of the process of preparing parcels for competitive offer and subsequent project-specific analysis. Potential culturally significant sites and landscapes in the vicinity of the SEZ associated with the Big Smoky Valley, Crescent Dunes, and other nearby geologic features, water sources, and sites and landscapes associated with Lake Tonopah, as well as plant and animal resources, should be considered and discussed during consultations.

## 11.7.19 Socioeconomics

### 11.7.19.1 Affected Environment

The boundaries of the proposed Millers SEZ have not changed. The socioeconomic ROI, the area in which site employees would live and spend their wages and salaries and into which any in-migration would occur, includes the same counties and communities as described in the Draft Solar PEIS, meaning that no updates to the affected environment information given in the Draft Solar PEIS are required.

### 11.7.19.2 Impacts

Socioeconomic resources in the ROI around the SEZ could be affected by solar energy development through the creation of direct and indirect employment and income, the generation of direct sales and income taxes, SEZ acreage rental and capacity payments to BLM, the in-migration of solar facility workers and their families, and impacts on local housing markets and on local community service employment. Since the boundaries of the proposed Millers SEZ remain unchanged and the reduction of the developable area is small (less than 2%), the impacts estimated in the Draft Solar PEIS remain valid. During construction, between 346 and 4,578 jobs and between $21 million and $278 million in income could be associated with solar development in the SEZ. During operations at full build-out, between 35 and 773 jobs and between $1.1 million and $26 million in income could be produced. In-migration of workers and their families would mean between 95 and 1,262 rental housing units would be needed during construction, and between 11 and 228 owner-occupied units during operations.

#### 11.7.19.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce socioeconomic impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features would reduce the potential for socioeconomic impacts during all project phases.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features to address socioeconomic impacts have been identified for the proposed Millers SEZ. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

### 11.7.20 Environmental Justice

#### 11.7.20.1 Affected Environment

The data presented in the Draft Solar PEIS for the proposed Millers SEZ have not substantially changed. There are no minority or low-income populations in the Nevada or California portions of the 50-mi (80-km) radius of the SEZ.

#### 11.7.20.2 Impacts

Potential impacts (e.g., from noise and dust during construction and operations, visual impacts, cultural impacts, and effects on property values) on low-income and minority populations could be incurred as a result of the construction and operation of solar facilities involving each of the four technologies. Impacts are likely to be small, because no minority populations defined by CEQ guidance (CEQ 1997) are within the 50-mi (80-km) radius around the boundary of the SEZ. That is, any adverse impacts of solar projects could not disproportionately affect minority populations. Because there are no low-income populations within the 50-mi (80-km) radius, there could be no impacts on low-income populations.

#### 11.7.20.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce potential environmental justice impacts are described in Section A.2.2 of Appendix A of this Final Solar PEIS. Implementing the programmatic design features will reduce the potential for such impacts.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features for environmental justice impacts have been identified. Some SEZ-specific design features may ultimately be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.7.21 Transportation

### 11.7.21.1 Affected Environment

The reduction of less than 2% in the developable area of the proposed Millers SEZ does not change the information on affected environment for transportation provided in the Draft Solar PEIS.

### 11.7.21.2 Impacts

As stated in the Draft Solar PEIS, the primary transportation impacts are anticipated to be from commuting worker traffic. Single projects could involve up to 1,000 workers each day with an additional 2,000 vehicle trips per day (maximum), or possibly 4,000 vehicle trips per day if two larger projects were to be developed at the same time. The volume of traffic on U.S. 95 along the southern edge of the Millers SEZ would represent an increase in traffic of about 100 or 200% for one or two projects, respectively, should all traffic access the SEZ in that area.

Because higher traffic volumes would be experienced during shift changes, traffic on U.S. 95 would experience slowdowns during these time periods in the vicinity of access roads for projects in the SEZ. Local road improvements would be necessary on any portion of U.S. 95 that might be developed so as not to overwhelm the local access roads near any site access point(s).

Solar development within the SEZ would affect public access along OHV routes that are designated open and available for public use. Although open routes crossing areas granted ROWs for solar facilities could be redesignated as closed (see Section 5.5.1 of the Draft Solar PEIS), a programmatic design feature has been included under Recreation (Section A.2.2.6.1 of Appendix A) that requires consideration of replacement of lost OHV route acreage and of access across and to public lands.

### 11.7.21.3 SEZ-Specific Design Features and Design Feature Effectiveness

Required programmatic design features that would reduce impacts on transportation are described in Section A.2.2 of Appendix A of this Final Solar PEIS. The programmatic design features, including local road improvements, multiple site-access locations, staggered work schedules, and ride-sharing, would all provide some relief to traffic congestion on local roads leading to the SEZ. Depending on the location of solar facilities within the SEZ, more specific access locations and local road improvements could be implemented.

On the basis of impact analyses conducted for the Draft Solar PEIS and consideration of comments received as applicable, no SEZ-specific design features to address transportation impacts in the proposed Millers SEZ have been identified. Some SEZ-specific design features may be identified through the process of preparing parcels for competitive offer and subsequent project-specific analysis.

## 11.7.22 Cumulative Impacts

The analysis of potential impacts in the vicinity of the proposed Millers SEZ presented in the Draft Solar PEIS is still generally applicable for this Final Solar PEIS. The size of the developable area of the proposed SEZ has been reduced by less than 2%. The following sections include an update to the information presented in the Draft Solar PEIS regarding cumulative effects for the proposed Millers SEZ.

### 11.7.22.1 Geographic Extent of the Cumulative Impact Analysis

The geographic extent of the cumulative impact analysis has not changed. The extent varies based on the nature of the resource being evaluated and the distance at which the impact may occur (e.g., impacts on air quality may have a greater geographic extent than impacts on visual resources). The BLM, USFS, and DoD administer most of the land around the SEZ; there are also some tribal lands nearby at the Yomba Reservation 48 mi (77 km) to the north of the SEZ. The BLM administers approximately 77% of the lands within a 50-mi (80-km) radius of the SEZ.

### 11.7.22.2 Overview of Ongoing and Reasonably Foreseeable Future Actions

The Draft Solar PEIS included six other proposed SEZs in Nevada. Two of these, Delamar Valley and East Mormon Mountain, have been removed from consideration.

The list of reasonably foreseeable future actions that relate to energy production and distribution near the proposed Millers SEZ has been updated and is presented in Table 11.7.22.2-1. Projects listed in the table are shown in Figure 11.7.22.2-1.

Other major ongoing and foreseeable actions within 50 mi (80 km) of the proposed Millers SEZ have been updated and are listed in Table 11.7.22.2-2.

### 11.7.22.3 General Trends

The information on general trends presented in the Draft Solar PEIS remains valid.

**TABLE 11.7.22.2-1 Ongoing and Reasonably Foreseeable Future Actions Related to Energy Development and Distribution near the Proposed Millers SEZ as Revised[a]**

| Description | Status | Resources Affected | Primary Impact Location |
|---|---|---|---|
| ***Fast-Track Solar Energy Projects on BLM-Administered Land*** | | | |
| Crescent Dunes Solar Energy Project (NVN-86292); **110 MW**, solar tower, **1,620 acres**[b] | **ROD December 20, 2010[c], under Construction** | Terrestrial habitats, wildlife, vegetation, water, soils, cultural, visual, aviation, and land use | 3 mi[d] east of the SEZ |
| ***Renewable Energy Development*** | | | |
| Darrough Hot Springs Geothermal Leasing Project; 27 MW, 160 acres | ROD August 18, 2009 | Terrestrial habitats, wildlife | 45 mi north of the SEZ |
| ***Transmission and Distribution Systems*** | | | |
| None | | | |

[a] Projects with status changed from that given in the Draft Solar PEIS are shown in bold text.

[b] To convert to km$^2$, multiply by 0.004047.

[c] See BLM (2010a) for details.

[d] To convert mi to km, multiply by 1.6093.

### 11.7.22.4 Cumulative Impacts on Resources

Total disturbance in the proposed Millers SEZ over 20 years is assumed to be up to about 13,227 acres (53.5 km$^2$) (80% of the entire proposed SEZ). This development would contribute incrementally to the impacts from other past, present, and reasonably foreseeable future actions in the region as described in the Draft Solar PEIS. Primary impacts from development in the Millers SEZ may include impacts on water quantity and quality, air quality, ecological resources such as habitat and species, cultural and visual resources, and to specially designated lands.

No additional major actions have been identified within 50 mi (80km) of the SEZ. Therefore, the incremental cumulative impacts associated with development in the proposed Millers SEZ during construction, operation, and decommissioning are expected to be the same as those projected in the Draft Solar PEIS.

## 11.7.23 Transmission Analysis

The methodology for this transmission analysis is described in Appendix G of this Final Solar PEIS. This section presents the results of the transmission analysis for the Millers SEZ,

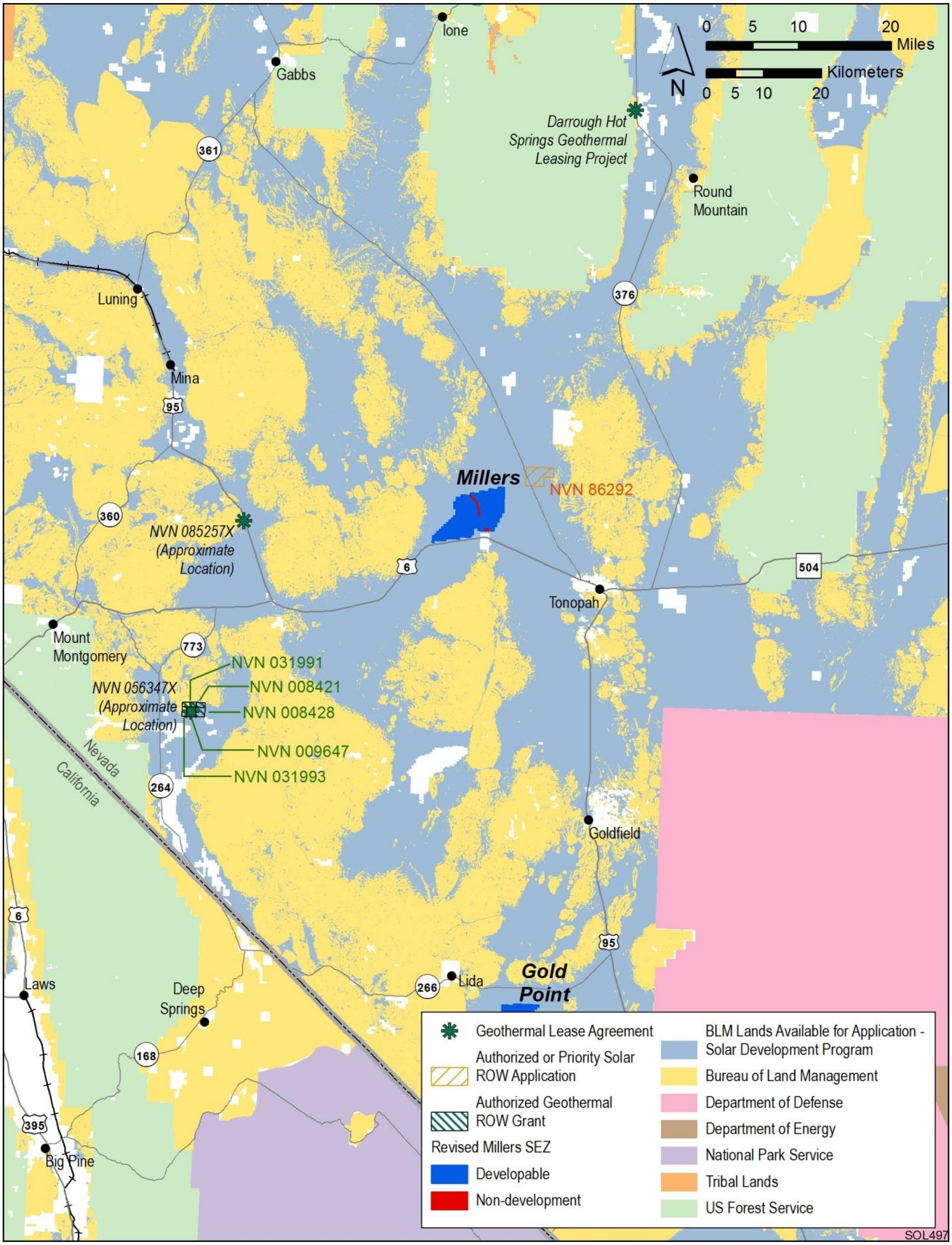


**FIGURE 11.7.22.2-1 Locations of Existing and Reasonably Foreseeable Renewable Energy Projects on Public Land with a 50-mi (80-km) Radius of the Proposed Millers SEZ as Revised**

**TABLE 11.7.22.2-2 Other Major Actions near the Proposed Millers SEZ as Revised**[a]

| Description | Status | Resources Affected | Primary Impact Location |
|---|---|---|---|
| Caliente Rail Realignment | FEIS June 2008 | Terrestrial habitats, wildlife cultural resources | 24 mi[b] southeast of the SEZ |
| Chemetall Foote Lithium Carbonate Facility Expansion | **FONSI September 22, 2010**[c] | Terrestrial habitats, wildlife, air quality | 30 mi south of the SEZ |
| Five Producing Geothermal Leases: NVN 8421, 8428, 9647, 31991, and 31993 | Operating | Terrestrial habitats, wildlife | 32 mi southwest of the SEZ |
| Mineral Ridge Project | **EA Amendment August 2011**[d]**; mining operations have started**[e] | Terrestrial habitats, groundwater, air quality | 28 mi south of the SEZ |
| Montezuma Peak HMA and Paymaster HMA Wild Horse and Burro Gather | **Completed**[f] | Terrestrial habitats, wildlife | 32 mi and 8 mi southeast of the SEZ |
| Round Mountain Mine Expansion; **4,698 acres**[g] **new surface disturbance**[h] | **ROD June 30, 2010**[h]**; expansion has started** | Terrestrial habitats, wildlife, cultural resources | 45 mi north of the SEZ |

a Projects with status changed from that given in the Draft Solar PEIS are shown in bold text.

b To convert mi to km, multiply by 1.6093.

c See Chemetall (2010) for details.

d See BLM (2011d) for details.

e See Golden Phoenix Minerals (2011) for details.

f See BLM (2010c) for details.

g To convert acres to km$^2$, multiply by 0.004047.

h See BLM (2010b) for details.

including the identification of potential load areas to be served by power generated at the SEZ and the results of the DLT analysis. Unlike Sections 11.7.2 through 11.7.22, this section is not an update of previous analysis for the Millers SEZ; this analysis was not presented in the Draft Solar PEIS. However, the methodology and a test case analysis were presented in the Supplement to the Draft Solar PEIS. Comments received on the material presented in the Supplement were used to improve the methodology for the assessment presented in this Final Solar PEIS.

The Millers SEZ represents one of the more complex cases because of its potential to generate a large amount of solar power. On the basis of its size, the assumption of a minimum of 5 acres (0.02 $km^2$) of land required per MW, and the assumption of a maximum of 80% of the land area developed, the Millers SEZ is estimated to have the potential to generate 2,645 MW of marketable solar power at full build-out.

### 11.7.23.1 Identification and Characterization of Load Areas

The primary candidates for Millers SEZ load areas are the major surrounding cities. Figure 11.7.23.1-1 shows the possible load areas for the Millers SEZ and the estimated portion of their market that could be served by solar generation. Possible load areas for the Millers SEZ include Phoenix and Tucson, Arizona; Salt Lake City, Utah; Las Vegas and Reno, Nevada; and San Diego, Los Angeles, San Jose, San Francisco, Oakland, and Sacramento, California.

The two load area groupings examined for the Millers SEZ are as follows:

1. Los Angeles, California; and

2. Reno, Nevada; Sacramento, Oakland, and San Francisco, California; and Las Vegas, Nevada.

Figure 11.7.23.1-2 shows the most economically viable transmission scheme for the Millers SEZ (transmission scheme 1), and Figure 11.7.23.1-3 shows an alternative transmission scheme (transmission scheme 2) that represents a logical choice should transmission scheme 1 be infeasible. As described in Appendix G, the alternative shown in transmission scheme 2 represents the optimum choice if one or more of the primary linkages in transmission scheme 1 are excluded from consideration. The groups provide for linking loads along alternative routes so that the SEZ's output of 2,645 MW could be fully allocated.

Table 11.7.23.1-1 summarizes and groups the load areas according to their associated transmission scheme and provides details on how the megawatt load for each area was estimated.

### 11.7.23.2 Findings for the DLT Analysis

The DLT analysis approach assumes that the Millers SEZ will require all new construction for transmission lines (i.e., dedicated lines) and substations. The new transmission lines(s) would directly convey the 2,645-MW output of the Millers SEZ to the prospective load areas for each possible transmission scheme. The approach also assumes that all existing transmission lines in the WECC region are saturated and have little or no available capacity to accommodate the SEZ's output throughout the entire 10-year study horizon.

Figures 11.7.23.1-2 and 11.7.23.1-3 display the pathways that new dedicated lines might follow to distribute solar power generated at the Millers SEZ via the two identified transmission schemes described in Table 11.7.23.1-1. These pathways parallel existing 500-kV, 230-kV, and

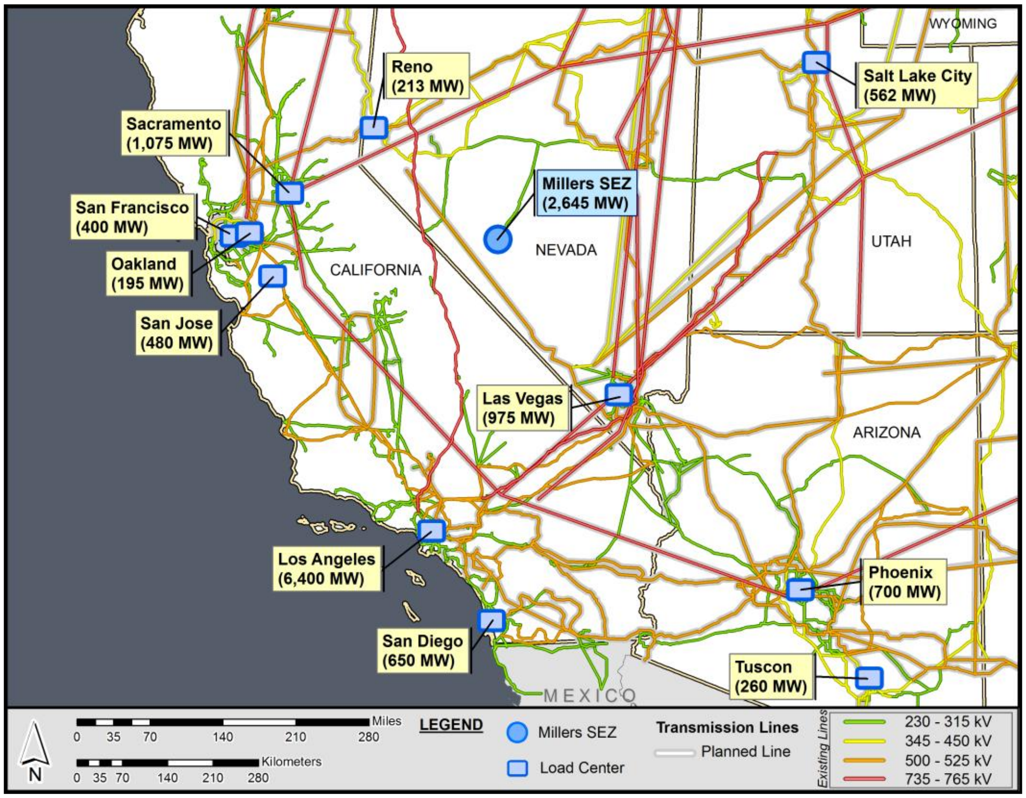


**FIGURE 11.7.23.1-1 Location of the Proposed Millers SEZ and Possible Load Areas (Source for background map: Platts 2011)**

lower voltage lines. The intent of following existing lines is to avoid pathways that may be infeasible due to topographical limitations or other concerns.

For transmission scheme 1, a new line would be constructed to connect with Los Angeles (6,400 MW), so that the 2,645-MW output of the Millers SEZ could be fully utilized (Figure 11.7.23.1-2). This particular scheme has two segments. The first segment extends about 30 mi (48 km) to the southwest from the SEZ to the switching station located at the corridor of the existing 345-kV line. On the basis of engineering and operational considerations, this segment would require a double-circuit 765-kV (2-765 kV) bundle of four conductors (Bof4) transmission line design. The second segment runs from the switching station to Los Angeles over a distance of about 294 mi (473 km).The transmission configuration options were determined by using the line "loadability" curve provided in American Electric Power's *Transmission Facts* (AEP 2010). Appendix G documents the line options used for this analysis and describes how the load area groupings were determined.

For transmission scheme 2, serving load centers to the northwest, west, and southeast, Figure 11.7.23.1-3 shows that new lines would be constructed to connect with Reno (213 MW), Sacramento (1,075 MW), Oakland (195 MW), San Francisco (400 MW), and Las Vegas (975 MW), so that the 2,645-MW output of the Millers SEZ could be fully utilized. This scheme

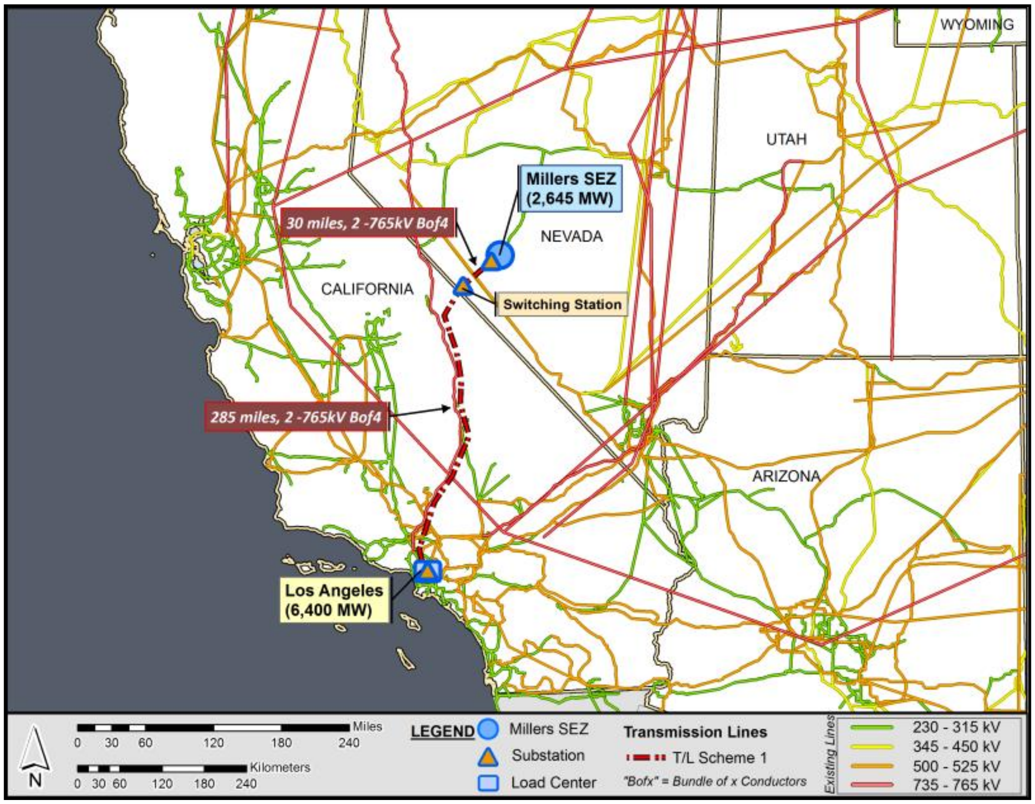


**FIGURE 11.7.23.1-2 Transmission Scheme 1 for the Proposed Millers SEZ (Source for background map: Platts 2011)**

has seven segments. The first segment extends 30 mi (48 km) to the southwest from the SEZ to the first switching station. The second segment runs to Reno (213 MW) over a distance of about 186 mi (299 km). This segment would require a double-circuit 500-kV (2-500 kV) bundle of three (Bof3) conductors transmission line design. The third segment runs about 104 mi (167 km) west from Reno to a switching station located just north of the Sacramento area, while the fourth segment extends from the switching station south about 23 mi (37 km) to Sacramento (1,075 MW). The fifth segment traverses a distance of about 98 mi (158 km) and links the Sacramento switching station to Oakland. The sixth line crosses a 12-mi (19-km) body of water via an existing bridge to serve loads in San Francisco. The seventh and final segment connects the first switching station near the SEZ to Las Vegas over a distance of about 200 mi (322 km).

Table 11.7.23.2-1 summarizes the distances to the various load areas over which new transmission lines would need to be constructed, as well as the assumed number of substations that would be required. One substation is assumed to be installed at each load area and an additional one at the SEZ. Thus, in general, the total number of substations per scheme is simply equal to the number of load areas associated with the scheme plus one. Substations at the load areas could consist of one or more step-down transformers, while the originating substation at the SEZ would consist of several step-up transformers. The originating substation would have a rating of at least 2,645 MW (to match the plant's output), while the combined load substations would have a similar total rating of 2,645 MW. For schemes that require branching of the lines,


**FIGURE 11.7.23.1-3 Transmission Scheme 2 for the Proposed Millers SEZ (Source for background map: Platts 2011)**

**TABLE 11.7.23.1-1 Candidate Load Area Characteristics for the Proposed Millers SEZ**

| Transmission Scheme | City/Load Area Name | Position Relative to SEZ | 2010 Population[c] | Estimated Total Peak Load (MW) | Estimated Peak Solar Market (MW) |
|---|---|---|---|---|---|
| 1 | Switching Stations | Southwest | 0 | 0 | 0 |
| | Los Angeles, California[a] | Southwest | 12,800,000 | 32,000 | 6,400 |
| 2 | Switching Stations | Southwest | 0 | 0 | 0 |
| | Reno, Nevada[a] | Northwest | 425,000 | 1,063 | 213 |
| | Sacramento, California[a] | West | 2,150,000 | 5,375 | 1,075 |
| | San Francisco, California[b] | West | 800,000 | 2,000 | 400 |
| | Oakland, California[b] | West | 390,000 | 975 | 195 |
| | Las Vegas, Nevada[a] | Southeast | 1,950,000 | 4,875 | 975 |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

[c] City and metropolitan area population data are from 2010 Census data (U.S. Bureau of the Census 2010).

**TABLE 11.7.23.2-1 Potential Transmission Schemes, Estimated Solar Markets, and Distances to Load Areas for the Proposed Millers SEZ**

| Transmission Scheme | City/Load Area Name[a] | Estimated Peak Solar Market (MW)[c] | Total Solar Market (MW) | Sequential Distance (mi)[d] | Total Distance (mi)[d] | Line Voltage (kV) | No. of Substations |
|---|---|---|---|---|---|---|---|
| 1 | Switching Stations | 0 | 6,400 | 30 | 324 | 765 | 3 |
| | Los Angeles, California[a] | 6,400 | | 294 | | | |
| 2 | Switching Stations | 0 | 2,858 | 30 | 652 | 500, 345, 230 | 8 |
| | Reno, Nevada[a] | 213 | | 186 | | | |
| | Sacramento, California[a] | 1,075 | | 127 | | | |
| | San Francisco, California[b] | 400 | | 12 | | | |
| | Oakland, California[b] | 195 | | 98 | | | |
| | Las Vegas, Nevada[a] | 975 | | 199 | | | |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

[c] From Table 11.7.23.1-1.

[d] To convert mi to km, multiply by 1.6093.

a switching substation is assumed to be constructed at the appropriate junction. In general, switching stations carry no local load but are assumed to be equipped with switching gears (e.g., circuit breakers and connecting switches) to reroute power as well as, in some cases, with additional equipment to regulate voltage.

Table 11.7.23.2-2 provides an estimate of the total land area disturbed for construction of new transmission facilities under each of the schemes evaluated. The most favorable transmission scheme with respect to minimizing costs and the area disturbed would be scheme 1, which would serve Los Angeles. This scheme is estimated to potentially disturb about 7,982 acres (32.3 km$^2$) of land. The less favorable transmission scheme with respect to minimizing costs and the area disturbed would be scheme 2, which serves multiple load areas in California and Las Vegas. For this scheme, the construction of new transmission lines and substations is estimated to disturb a land area on the order of 14,924 acres (60.4 km$^2$).

Table 11.7.23.2-3 shows the estimated NPV of both transmission schemes and takes into account the cost of constructing the lines, the substations, and the projected revenue stream over the 10-year horizon. A positive NPV indicates that revenues more than offset investments. This calculation does not include the cost of producing electricity.

The most economically attractive configuration (transmission scheme 1) has the highest positive NPV and serves Los Angeles. The secondary case (transmission scheme 2), which excludes one or more of the primary pathways used in scheme 1, is less economically attractive

**TABLE 11.7.23.2-2 Comparison of the Various Transmission Line Configurations with Respect to Land Use Requirements for the Proposed Millers SEZ**

| Transmission Scheme | City/Load Area Name | Total Distance (mi)[c] | No. of Substations | Land Use (acres)[d] Transmission Line | Substation | Total |
|---|---|---|---|---|---|---|
| 1 | Switching Stations<br>Los Angeles, California[a] | 324 | 3 | 7,854.5 | 126.9 | 7,981.5 |
| 2 | Switching Stations<br>Reno, Nevada[a]<br>Sacramento, California[a]<br>San Francisco, California[b]<br>Oakland, California[b]<br>Las Vegas, Nevada[a] | 652 | 8 | 14,763.6 | 160.2 | 14,923.8 |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

[c] To convert mi to km, multiply by 1.6093.

[d] To convert acres to $km^2$, multiply by 0.004047.

**TABLE 11.7.23.2-3 Comparison of Potential Transmission Lines with Respect to NPV (Base Case) for the Proposed Millers SEZ**

| Transmission Scheme | City/Load Area Name | Present Value Transmission Line Cost ($ million) | Present Value Substation Cost ($ million) | Annual Sales Revenue ($ million) | Present Worth of Revenue Stream ($ million) | NPV ($ million) |
|---|---|---|---|---|---|---|
| 1 | Switching Stations<br>Los Angeles, California[a] | 1,822 | 174.6 | 463.4 | 3,578.3 | 1,581.2 |
| 2 | Switching Stations<br>Reno, Nevada[a]<br>Sacramento, California[a]<br>San Francisco, California[b]<br>Oakland, California[b]<br>Las Vegas, Nevada[a] | 2,085.9 | 174.6 | 463.4 | 3,578.3 | 1,317.8 |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

and serves several markets. For the assumed utilization factor of 20%, both options exhibit positive NPVs, implying varying degrees of economic viability under the current assumptions.

Table 11.7.23.2-4 shows the effect of varying the value of the utilization factor on the NPV of the various transmission schemes. It also shows that as the utilization factor is increased, the economic viability of the lines increases. Utilization factors can be raised by allowing the new dedicated lines to market other power generation outputs in the region in addition to that of its associated SEZ.

The findings of the DLT analysis for the proposed Millers SEZ are as follows:

- Transmission scheme 1, which identifies Los Angeles as the primary market, represents the most favorable option based on NPV and land use requirements. This configuration would result in new land disturbance of about 7,982 acres (32.3 $km^2$).

- Transmission scheme 2, which represents an alternative configuration if Los Angeles is excluded, serves Reno, Sacramento, San Francisco, and Oakland. This configuration would result in new land disturbance of about 14,924 acres (60.4 $km^2$).

- Other load area configurations are possible but would be less favorable than scheme 1 in terms of NPV and, in most cases, also in terms of land use requirements. If new electricity generation at the proposed Millers SEZ is not sent to either of the two markets identified above, the potential upper-bound impacts in terms of cost would be greater.

**TABLE 11.7.23.2-4 Effects of Varying the Utilization Factor on the NPV of the Transmission Schemes for the Proposed Millers SEZ**

| Transmission Scheme | City/Load Area Name | NPV ($ million) at Different Utilization Factors | | | | | |
|---|---|---|---|---|---|---|---|
| | | 20% | 30% | 40% | 50% | 60% | 70% |
| 1 | Switching Stations<br>Los Angeles, California[a] | 1,581.2 | 3,370.4 | 5,159.5 | 6,948.6 | 8,737.8 | 10,526.9 |
| 2 | Switching Stations<br>Reno, Nevada[a]<br>Sacramento, California[a]<br>San Francisco, California[b]<br>Oakland, California[b]<br>Las Vegas, Nevada[a] | 1,317.8 | 3,107.0 | 4,896.1 | 6,685.2 | 8,474.4 | 10,263.5 |

[a] The load area represents the metropolitan area (i.e., the identified city plus adjacent communities).

[b] The load area represents the city named.

- The analysis of transmission requirements for the proposed Millers SEZ indicates no reduction of impacts from increasing the solar-eligible load assumption for transmission scheme 1, which brings power to Los Angeles. Increasing the solar-eligible percentage would have no effect, because an adequate load area was identified under the 20% assumption that would accommodate all of the SEZ's capacity. Thus, line distances and voltages would not be affected by increasing the solar-eligible load assumption, and similarly the associated costs and land disturbance would not be affected. However, for transmission scheme 2, which serves Reno, Sacramento, San Francisco, and Oakland, increasing the assumed solar-eligible load assumption could result in lower cost and land disturbance estimates, because it is likely that fewer load areas would be needed to accommodate the SEZ's capacity.

### 11.7.24 Impacts of the Withdrawal

The BLM is proposing to withdraw 16,797 acres (67 $km^2$) of public land comprising the proposed Millers SEZ from settlement, sale, location, or entry under the general land laws, including the mining laws, for a period of 20 years (see Section 2.2.2.2.4 of the Final Solar PEIS). The public lands would be withdrawn, subject to valid existing rights, from settlement, sale, location, or entry under the general land laws, including the mining laws. This means that the lands could not be appropriated, sold, or exchanged during the term of the withdrawal, and new mining claims could not be filed on the withdrawn lands. Mining claims filed prior to the segregation or withdrawal of the identified lands would take precedence over future solar energy development. The withdrawn lands would remain open to the mineral leasing, geothermal leasing, and mineral material laws, and the BLM could elect to lease the oil, gas, coal, or geothermal steam resources, or to sell common-variety mineral materials, such as sand and gravel, contained in the withdrawn lands. In addition, the BLM would retain the discretion to authorize linear and renewable energy ROWs on the withdrawn lands.

The purpose of the proposed land withdrawal is to minimize the potential for conflicts between mineral development and solar energy development for the proposed 20-year withdrawal period. Under the land withdrawal, there would be no mining-related surface development, such as the establishment of open pit mining, construction of roads for hauling materials, extraction of ores from tunnels or adits, or construction of facilities to process the material mined, that could preclude use of the SEZ for solar energy development. For the Millers SEZ, the impacts of the proposed withdrawal on mineral resources and related economic activity and employment are expected to be negligible because the mineral potential of the lands within the SEZ is low (BLM 2012). There has been no documented mining within the SEZ, and there are no known locatable mineral deposits within the land withdrawal area. According to the LR2000 (accessed in May 2012), there are no recorded mining claims within the land withdrawal area.

Although the mineral potential of the lands within the Millers SEZ is low, the proposed withdrawal of lands within the SEZ would preclude many types of mining activity over a 20-year period, resulting in the avoidance of potential mining related adverse impacts. Impacts commonly related to mining development include increased soil erosion and sedimentation, water use, generation of contaminated water in need of treatment, creation of lagoons and ponds (hazardous to wildlife), toxic runoff, air pollution, establishment of noxious weeds and invasive species, habitat destruction or fragmentation, disturbance of wildlife, blockage of migration corridors, increased visual contrast, noise, destruction of cultural artifacts and fossils and/or their context, disruption of landscapes and sacred places of interest to tribes, increased traffic and related emissions, and conflicts with other land uses (e.g., recreational).

### 11.7.25 References

*Note to Reader:* This list of references identifies Web pages and associated URLs where reference data were obtained for the analyses presented in this Final Solar PEIS. It is likely that at the time of publication of this Final Solar PEIS, some of these Web pages may no longer be available or their URL addresses may have changed. The original information has been retained and is available through the Public Information Docket for this Final Solar PEIS.

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## 11.7.26 Errata for the Proposed Millers SEZ

This section presents corrections to material presented in the Draft Solar PEIS and the Supplement to the Draft. The need for these corrections was identified in several ways: through comments received on the Draft Solar PEIS and the Supplement to the Draft (and verified by the authors), through new information obtained by the authors subsequent to publication of the Draft Solar PEIS and the Supplement to the Draft, or through additional review of the original material by the authors. Table 11.7.26-1 presents corrections to the material presented in the Draft Solar PEIS and the Supplement to the Draft.

**TABLE 11.7.26-1 Errata for the Proposed Millers SEZ (Section 11.7 of the Draft Solar PEIS and Section C.4.5 of the Supplement to the Draft Solar PEIS)**

| Section No. | Page No. | Line No. | Figure No. | Table No. | Correction |
|---|---|---|---|---|---|
| 11.7.11.2 | | | | | All uses of the term ‘‘neotropical migrants’’ in the text and tables of this section should be replaced with the term ‘‘passerines.’’ |
| 11.7.13.2.1 | 11.7-144 | 9 | | | The sentence ‘‘Uniformly distributed emissions of 3,000 acres (12.1 $km^2$) each and 6,000 acres (24.3 $km^2$) in total, in the southeastern portion of the SEZ, close to the nearest residences and the town of Tonopah,’’ should read, ‘‘Uniformly distributed emissions of 3,000 acres (12.1 $km^2$) each and 6,000 acres (24.3 $km^2$) in total, in the eastern portion of the SEZ, close to the nearest residences and the town of Tonopah.’’ |

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